LANCE MORROW ON NORMAN MAILER (p. 94) ~ JAN MORRIS ON OXFORD (p. 22)

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{ JANUARY 2008 }

## 1908: The Year That Changed Everything

## One Man's Quest to Find Columbus' Fort

## 28 PLACES TO SEE BEFORE YOU DIE

## Van Gogh's Letters to a Protégé

## Monkey Think, Monkey Do

## David Maisel's Troubling Earth Images

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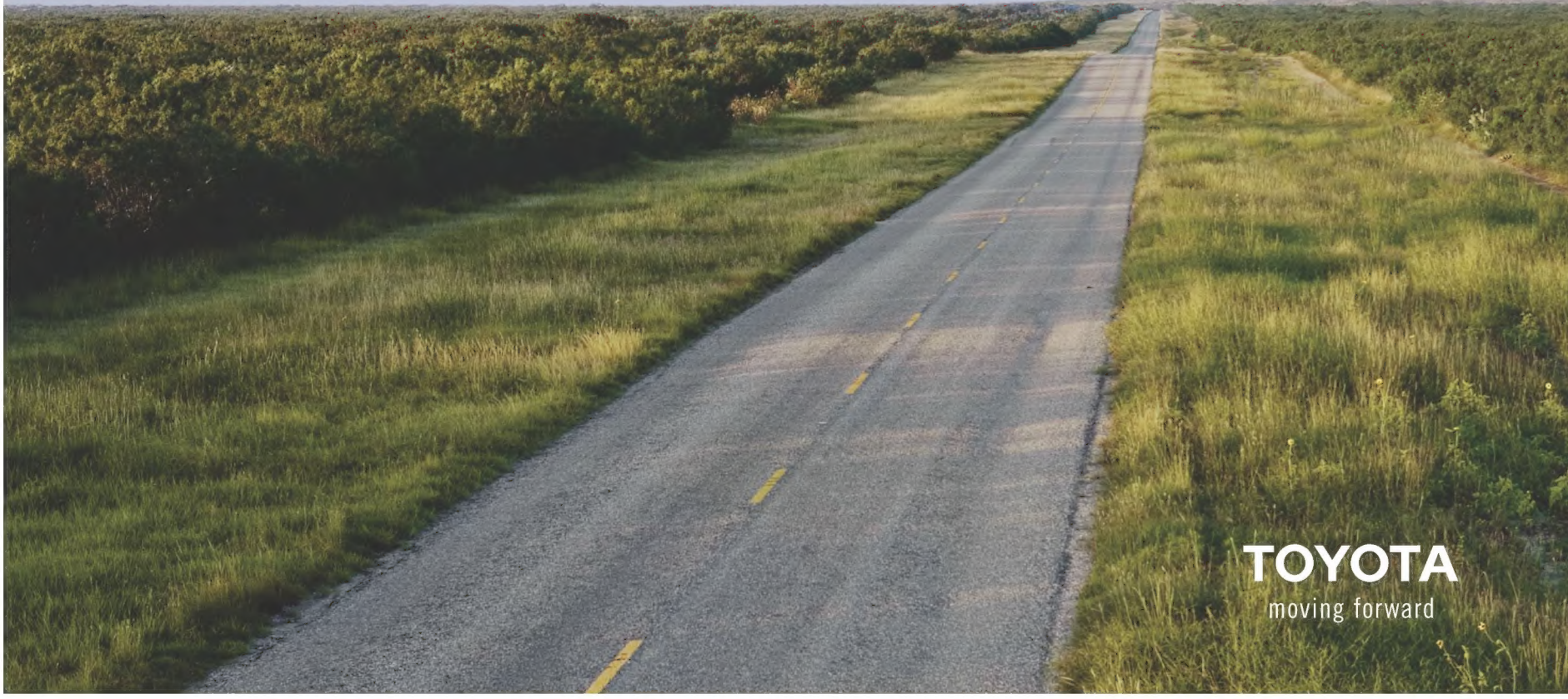

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{ JANUARY 2008 · VOLUME 38, NUMBER 10 }

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**THIS PAGE:** Vincent van Gogh, *Landscape with the Edge of a Road*, 1888. Pommersches Landesmuseum, Griefswald.

**COVER:** India's Taj Mahal was built in the 17th century by Emperor Shah Jahan in memory of his wife, Mumtaz Mahal, who died in childbirth. Photograph by Blaine Harrington.

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Maisel describes the usual reaction to his work as "this experience where people are seduced by the seeming surface beauty of an image, then as they learn more about what it is, they realize there is, in a way, a betrayal." "DANGER ZONES," PAGE 52

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### Letters from an Artist

See more of van Gogh's never-before-exhibited letters to a protégé at **Smithsonian.com/vangogh**

### *Smithsonian* Life List

Go online and tell us which of the 28 places made it on your list at **Smithsonian.com/lifelist**

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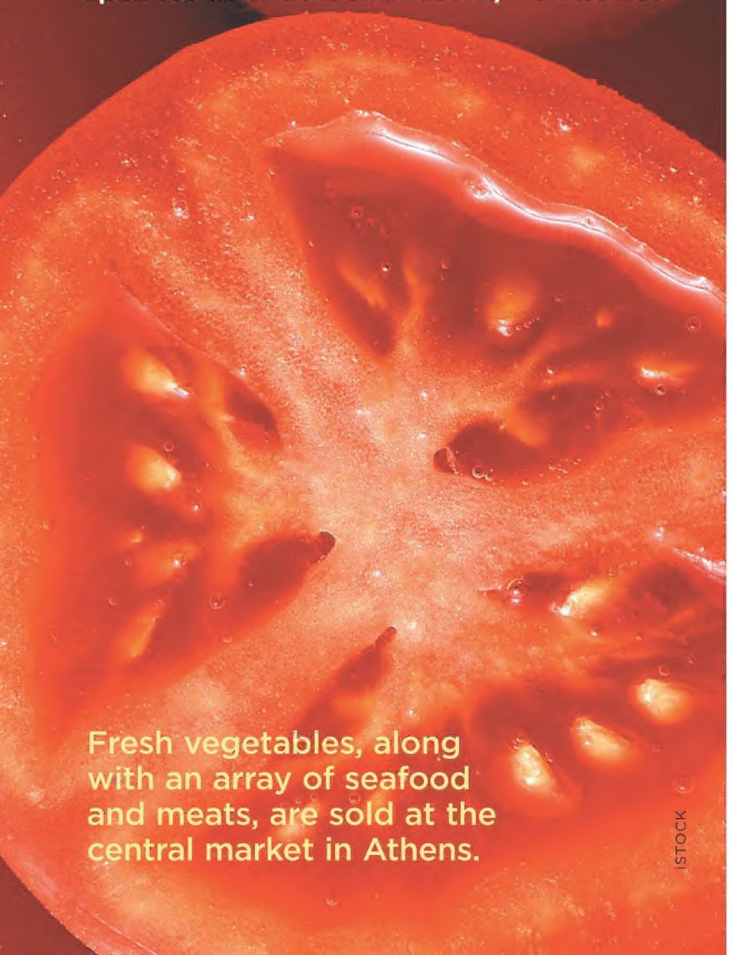

Fresh vegetables, along with an array of seafood and meats, are sold at the central market in Athens.

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# FROM THE EDITOR

# Pulled by Bears

## In 1908, anything was possible

**BY CAREY WINFREY**

IN RESEARCHING A BOOK about ironworkers and skyscrapers, Jim Rasenberger was struck by the energy and zany optimism of Americans living in the first decade of the 20th century. There was explorer Roald Amundsen, for example, who told the *New York Times* that he intended to have himself pulled to the North Pole by polar bears. "There were a lot of things like that," says Rasenberger. "I think that Americans were at this stage where they had enough confidence scientifically and technologically to think that anything was possible but not enough knowledge to realize that, in fact, everything was *not* possible. So there was this wonderful sense of limitlessness." The more Rasenberger read, the more he came to see 1908 as an exceptional, even pivotal moment: the year the Model T Ford came out, the year Robert Peary left for the North Pole (and the year Frederick Cook said he discovered the North Pole) and the year that the Wright brothers finally convinced the world that airplanes were here to stay: Wilbur flew in front of thousands of people for 2 hours and 20 minutes. Says Rasenberger: "That must have rocked people's world; it must have been a wild time to be alive."

**Rasenberger: "It must have been a wild time to be alive."**

Rasenberger immersed himself in 1908 by reading, over several weeks, that year's entire *New York Times* from start to finish. ("It was tremendous fun.") The immersion was so complete, he says, "I was almost dreaming 1908. All my references were 1908. Any conversation included some discussion of 1908. Any date I wrote, it was always '08, including on a few checks. It was like living in this 1908 time machine."

So how does one hundred years ago compare to the present? In some ways, particularly in urban America, very familiarly. "They rode the subway to work. They had electricity. They went to see movies, Broadway shows. They were interested in things we're interested in. They worried about diet. They worried that Christmas was becoming too commercialized." And yet, it was also a very different world. The disparity between rich and poor was vast, as it was between classes, sexes and races. "Even though most of us understand that America was a very racist country a hundred years ago, when I went back and read newspapers and magazines, I was really stunned by just how racist it was. And I don't mean just the lynching and the overt discrimination but the casual racism in fine magazines like *Harper's Weekly* or in otherwise decent newspapers like the *New York Times*. I was struck by the fact that African-Americans had no one in their corner other than themselves back then. That really shocked me."

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MICHAEL LORENZINI

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# LETTERS READERS RESPOND TO THE **NOVEMBER** ISSUE

David Halberstam ("Command Performance") was obviously an admirer of Gen. Matthew B. Ridgway and had little regard for Gen. Douglas MacArthur. Korea was one of our *political* wars. Generals did not fight it—politicians did. I was there—a 19-year-old airman—and understood how politicians were tying MacArthur's hands behind his back and telling him to fight a war he couldn't win.

**ROBERT HILL**, LA VETA, COLORADO

### RIDGWAY'S DUE

HALBERSTAM'S ARTICLE about Ridgway's turnaround of the Korean War was long overdue. For too many years all the credit (and none of the blame) went to Douglas MacArthur, by far the most overrated Army commander since McClellan.

**WILLIAM F. MAHONEY**
ALBANY, NEW YORK

I WAS DEEPLY pleased to see the article about General Ridgway. He was indeed a soldier's general. He treated his soldiers with a fatherly affection and respect, but was never patronizing. We knew this was the highest commander we were ever likely to converse with, but we were inspired and encouraged, not intimidated. I met him on a cold winter day in Seoul, when he arrived to replace the late Lt. Gen. Walton H. Walker as commander of the Eighth Army. Ridgway was wearing his trademark grenade and carrying an M-1 rifle. He walked up to me, a private first class, extended a hand and said, "Name's Ridgway. What's yours?" I told him my name, and the next time I saw him he remembered it. I could relate several anecdotes reflecting his fiery dedication to his mission and his unswerving care for the morale and welfare of his troops as individuals.

**WILLIAM J. OPFERMAN**
SACRAMENTO, CALIFORNIA

### OTHER GATES TO PARADISE

ARTHUR LUBOW'S article on sculptor Lorenzo Ghiberti's gilded doors ("The Gates of Paradise") did not point out that the original doors, which stood at the ancient Baptistery of San Giovanni in Florence, were removed and hidden in a railway tunnel for safekeeping during World War II. After the war, Bruno Bearzi, official caretaker of Florence's artworks, made a mold of the doors. Three replicas have been produced from the mold: one was sold to San Francisco's Grace Cathedral, another went to the Trinity Lutheran Church in Hicksville, New York, and the third replaced the original doors at the Florence Baptistery, which will reside in the nearby Duomo museum (after the doors are reunited with their gilt decorative panels next year).

**JERE FRENCH**
GULF BREEZE, FLORIDA

### SAVE THE CORN

RICHARD CONNIFF'S article about the trade-offs of ethanol and other biofuels ("Who's Fueling Whom?") mentioned the possibility of converting cornstalks into engine fuels. Please keep in mind that this approach, too, has a downside. Cornstalks are needed for long-term soil protection against wind and water erosion and for their organic matter, which maintains soil quality. Uprooting them is unfathomable in this era of knowledgeable agriculture.

**JOHN E. MORRISON**
UNICOI, TENNESSEE

### AGAINST INNOVATION

I HOPE MY not being enamored of your special issue (37 Under 36: America's Young Innovators) doesn't make me a boorish oaf, but I suggest you mail it instead to the friends and relatives of those who appeared in the issue, not to subscribers who are looking for interesting reading.

**JOHN KERHLIKAR**
SHINGLE SPRINGS, CALIFORNIA

AFTER YEARS of negative news stories about poverty, violence, greed, corrupt politicians and our failed educational system, I had almost begun a free fall into the pits of cynicism. Reading your special issue about young innovators reassured me there is a great future ahead for us.

**BENJAMIN J. LEGETT**
COVINGTON, LOUISIANA

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# Big News

In matters of sheer magnitude, Robert Howlett got the picture **BY VICTORIA OLSEN**

IT WAS ORIGINALLY CALLED *Leviathan*, and it was supposed to be a monster of the deep seas. Nearly 700 feet long and 60 feet high, the double-hulled iron steamer renamed *Great Eastern* was twice the length and triple the tonnage of any other ship when it was launched in 1858. Intended to shrink the vast distances of the British Empire, it could carry 4,000 passengers from England to Australia without stopping to refuel.

The *Times of London* declared that "its immensity is so great in comparison with all the notions previously conceived of monster ships that it seems to elude comprehension and weigh upon the mind." And yet *Great Eastern* never met the outsize expectations of its designer, a celebrated engineer named Isambard Kingdom Brunel.

Brunel's mammoth project was big news when the *Times* commissioned a young photographer named Robert Howlett to document the construction of the ship on the Thames River in 1857. Howlett's task was to use one new technology to serve another: photography was just 30 years old when he brought his box camera and glass plates to the docks to create what would become a famous portrait of Brunel in front of the launching chains of his new ship. Drawing on the conventions of portrait painting, Howlett captured a hands-on but nonchalant Brunel standing proudly before his masterwork unconcerned about his dirty trousers. The photograph emphasizes the scale of the achievement: the enormous chain links, subtly echoed in Brunel's watch chain, almost dwarf the man who ordered them. Indeed, Brunel stood 5-foot-4 and was nicknamed the Little Giant for his grand ambitions. Before taking on *Great Eastern,* he had built two other steamships and,

**Oversize expectations: the *Great Eastern* vessel was supposed to cap the career of its ill-fated designer, Isambard Kingdom Brunel (before the huge ship's launching chains).**

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photo by Bill Bernstein

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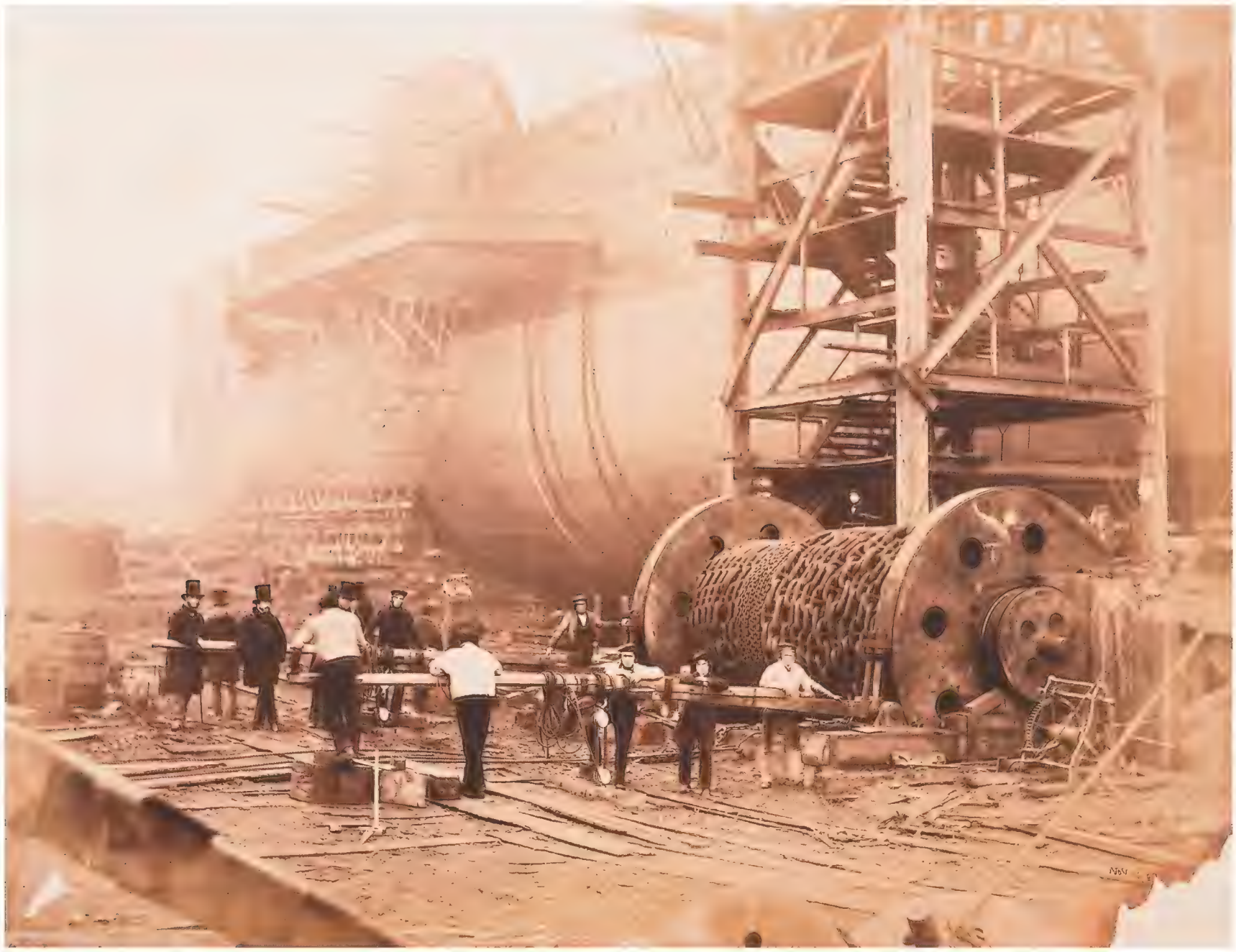

**As a feat of engineering, the huge ship (under construction on the Thames) was a success. As a commercial enterprise, it failed.**

VICTORIA AND ALBERT MUSEUM, LONDON, UK

as chief engineer of the Great Western Railway, constructed the first rail link between London and Bristol.

*Great Eastern* was supposed to cap a triumphant career, and as a feat of engineering it was undeniably remarkable. To power it through the water, eight engines drove a screw propeller and two side paddle wheels. (The ship also had six masts and 6,500 square yards of sail in case the engines failed.) Built with separate watertight compartments, it would survive a collision with a submerged rock off Long Island, New York. But constructing, launching and outfitting the ship cost more than $3.5 million and bankrupted its builder, John Scott Russell.

In fact, the ship seemed to tow bad luck in its wake. Howlett died in 1858 at the age of 27. His friends speculated that the chemicals used in the arduous process of developing glass-plate negatives had poisoned him. Brunel suffered a stroke on deck during *Great Eastern*'s final inspection tour, September 5, 1859, and died ten days later, at 53—having survived long enough to learn that an onboard explosion had killed six men during the ship's sea trials.

Afloat, the ship was a commercial failure. There were only 35 passengers on its maiden, transatlantic voyage to New York. The long hull rolled unpleasantly in storms, and accidents at sea brought costly repairs and delays. In 1864 Brunel's dream ship was sold and achieved its greatest success laying cable for the first permanent transatlantic telegraph lines. After the vessel was scrapped, in 1888, it took 200 men two years to dismantle its iron hull. Not until RMS *Celtic* was launched in 1901 was *Great Eastern*'s tonnage surpassed. Brunel's friend and fellow engineer, Sir Daniel Gooch, lamented, "Poor old ship: you deserved a better fate."

Still, the ship retained its hold on the popular imagination. Jules Verne, known for his interest in new technologies, traveled on *Great Eastern* during one of its last attempts at passenger service in 1867. In his novel *The Floating City*, he rhapsodized about "this enormous bulk borne on the waves, her defiant struggle with the wind, her boldness before the powerless sea, her indifference to the billows." But a character in the book also insists that the ship is "bewitched" and predicts catastrophe. Today Howlett's photograph foreshadows a world revolutionized by industrialization. But it is an ambiguous vision: despite Brunel's air of prosperity and enterprise, he appears enchained by his own creation.

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**VICTORIA OLSEN** *is the author of* From Life: Julia Margaret Cameron and Victorian Photography.

# Understand the risks. See the benefits.™

## What should I know about NSAIDs?

When it comes to relieving arthritis pain, you may think some prescription NSAID pain relievers, like ibuprofen and naproxen, don't have any cardiovascular risks. But based on the available research, that's not clear. And if you look closer, the FDA requires all these prescription NSAID pain relievers, including Celebrex, to have the same cardiovascular warning about heart attack or stroke.

## What about heart attack or stroke?

Any prescription NSAID, including Celebrex, may increase the chance of heart attack or stroke, which can lead to death. This chance increases if you have heart disease or risk factors for it, such as high blood pressure, or when NSAIDs are taken for long periods.

## How do NSAIDs affect my stomach?

All prescription NSAIDs, including Celebrex, also increase the chance of stomach and intestine problems, such as bleeding and ulcers, which can occur without warning and may cause death. With any of these medicines, patients also taking aspirin and the elderly are at increased risk for stomach bleeding and ulcers.

## What does this mean for Celebrex?

All prescription NSAIDs have some of the same warnings, and they all help treat arthritis pain. But since individual results may vary, having options is important. An NSAID, like Celebrex, may be one option.

You also may be surprised to learn, prescription Celebrex has never been taken off the market. Actually, based on the available data, the FDA stated that for certain patients Celebrex's benefits outweigh the risks. But only you and your doctor can make that decision.

## What are the benefits?

Celebrex can be used with low-dose aspirin. Other prescription NSAIDs aren't generally recommended with aspirin. What's more, just one 200-mg dose provides 24-hour relief. And if you are concerned about stomach upset, you should know, in clinical studies, a lower percentage of patients taking Celebrex reported stomach discomfort, which includes indigestion, abdominal pain and nausea, versus prescription ibuprofen and naproxen.

## What does it do for arthritis pain?

Celebrex relieves arthritis pain. It also relieves stiffness and inflammation associated with arthritis pain.

## Any other precautions?

All NSAIDs, including Celebrex, should be used at the lowest dose possible, for the shortest time, based on your individual treatment goals. Do not take Celebrex if you're pregnant or have had allergic reactions to aspirin or sulfonamides. All NSAIDs, including Celebrex, increase the chance of serious skin reactions. And tell your doctor if you've had kidney or liver problems.

## What next?

For many with arthritis pain, not treating is not an option. Talk to your doctor about Celebrex and see what's right for you.

Visit celebrex.com or call 1-888-celebrex. But most importantly, your doctor can tell you about the risks and benefits of all NSAID pain relievers.

*Please turn page to see important information about Celebrex and other NSAIDs.*

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## Medication Guide
## for Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

(See the end of this Medication Guide for a list of prescription NSAID medicines.)

**What is the most important information I should know about medicines called Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?**

**NSAID medicines may increase the chance of a heart attack or stroke that can lead to death.**
This chance increases:
- with longer use of NSAID medicines
- in people who have heart disease

**NSAID medicines should never be used right before or after a heart surgery called a "coronary artery bypass graft (CABG)."**
**NSAID medicines can cause ulcers and bleeding in the stomach and intestines at any time during treatment. Ulcers and bleeding:**
- can happen without warning symptoms
- may cause death

**The chance of a person getting an ulcer or bleeding increases with:**
- taking medicines called "corticosteroids" and "anticoagulants"
- longer use
- smoking
- drinking alcohol
- older age
- having poor health

**NSAID medicines should only be used:**
- exactly as prescribed
- at the lowest dose possible for your treatment
- for the shortest time needed

**What are Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?**
NSAID medicines are used to treat pain and redness, swelling, and heat (inflammation) from medical conditions such as:
- different types of arthritis
- menstrual cramps and other types of short-term pain

**Who should not take a Non-Steroidal Anti-Inflammatory Drug (NSAID)?**
**Do not take an NSAID medicine:**
- if you had an asthma attack, hives, or other allergic reaction with aspirin or any other NSAID medicine
- for pain right before or after heart bypass surgery

**Tell your healthcare provider:**
- about all of your medical conditions.
- about all of the medicines you take. NSAIDs and some other medicines can interact with each other and cause serious side effects. **Keep a list of your medicines to show to your healthcare provider and pharmacist.**
- if you are pregnant. **NSAID medicines should not be used by pregnant women late in their pregnancy.**
- if you are breastfeeding. **Talk to your doctor.**

**What are the possible side effects of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)?**

| **Serious side effects include:** | **Other side effects include:** |
|---|---|
| • heart attack<br>• stroke<br>• high blood pressure<br>• heart failure from body swelling (fluid retention)<br>• kidney problems including kidney failure<br>• bleeding and ulcers in the stomach and intestine<br>• low red blood cells (anemia)<br>• life-threatening skin reactions<br>• life-threatening allergic reactions<br>• liver problems including liver failure<br>• asthma attacks in people who have asthma | • stomach pain<br>• constipation<br>• diarrhea<br>• gas<br>• heartburn<br>• nausea<br>• vomiting<br>• dizziness |

**Get emergency help right away if you have any of the following symptoms:**
- shortness of breath or trouble breathing
- chest pain
- weakness in one part or side of your body
- slurred speech
- swelling of the face or throat

**Stop your NSAID medicine and call your healthcare provider right away if you have any of the following symptoms:**
- nausea
- more tired or weaker than usual
- itching
- your skin or eyes look yellow
- stomach pain
- flu-like symptoms
- vomit blood
- there is blood in your bowel movement or it is black and sticky like tar
- skin rash or blisters with fever
- unusual weight gain
- swelling of the arms and legs, hands and feet

These are not all the side effects with NSAID medicines. Talk to your healthcare provider or pharmacist for more information about NSAID medicines.

**Other information about Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)**
- Aspirin is an NSAID medicine but it does not increase the chance of a heart attack. Aspirin can cause bleeding in the brain, stomach, and intestines. Aspirin can also cause ulcers in the stomach and intestines.
- Some of these NSAID medicines are sold in lower doses without a prescription (over-the-counter). Talk to your healthcare provider before using over-the-counter NSAIDs for more than 10 days.

**NSAID medicines that need a prescription**

| Generic Name | Tradename |
|---|---|
| Celecoxib | Celebrex |
| Diclofenac | Cataflam, Voltaren, Arthrotec (combined with misoprostol) |
| Diflunisal | Dolobid |
| Etodolac | Lodine, Lodine XL |
| Fenoprofen | Nalfon, Nalfon 200 |
| Flurbiprofen | Ansaid |
| Ibuprofen | Motrin, Tab-Profen, Vicoprofen* (combined with hydrocodone), Combunox (combined with oxycodone) |
| Indomethacin | Indocin, Indocin SR, Indo-Lemmon, Indomethagan |
| Ketoprofen | Oruvail |
| Ketorolac | Toradol |
| Mefenamic Acid | Ponstel |
| Meloxicam | Mobic |
| Nabumetone | Relafen |
| Naproxen | Naprosyn, Anaprox, Anaprox DS, EC-Naproxyn, Naprelan, Naprapac (copackaged with lansoprazole) |
| Oxaprozin | Daypro |
| Piroxicam | Feldene |
| Sulindac | Clinoril |
| Tolmetin | Tolectin, Tolectin DS, Tolectin 600 |

*Vicoprofen contains the same dose of ibuprofen as over-the-counter (OTC) NSAIDs, and is usually used for less than 10 days to treat pain. The OTC NSAID label warns that long term continuous use may increase the risk of heart attack or stroke.

*This Medication Guide has been approved by the U.S. Food and Drug Administration.*

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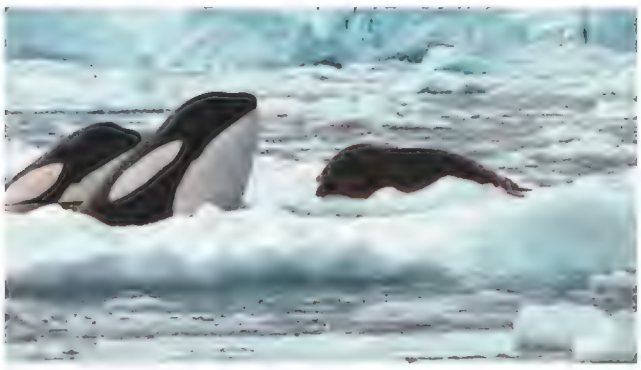
# WILD THINGS

## LIFE AS WE KNOW IT

BY JESS BLUMBERG, T.A. FRAIL, MEGAN GAMBINO, LAURA HELMUTH AND SARAH ZIELINSKI

### OUR UNLIKELY NEXT OF KIN

The colugo, a foot-long nocturnal glider from Southeast Asia, is the closest living relative of primates. Researchers from Texas A&M University and elsewhere compared genes from colugos, tree shrews and 30 other mammals with genes from primates such as macaques and humans. They found rare genetic changes suggesting that colugos' and primates' evolutionary paths diverged about 86 million years ago, during the reign of the dinosaurs.



### NOWHERE TO HIDE

Orcas are even more cunning than their nickname—killer whales—suggests. A new analysis of field observations in Antarctica made over nearly 30 years shows that orcas, which are dolphins rather than true whales, can hunt down seals and penguins seemingly out of reach on an ice floe. Working alone or in a group, orcas create waves that dislodge a floe, break it up and wash the stranded prey into open water. The skill is probably learned: baby orcas watch the wave-making frenzy.

### FATE OF THE FLOWER

The American bellflower can live for either one year or two. Which strategy does a seed adopt? It takes a cue from its parent. Scientists from Virginia and Minnesota say bellflowers grown in sunny spots produce seeds that are likely to become annuals, which thrive in full sun; shaded bellflowers yield seeds more likely to become shade-loving biennials.

## Observed

**NAME:** *Zonotrichia leucophrys gambelii*, or the white-crowned sparrow.
**SUMMERS IN:** Alaska.
**WINTERS IN:** Mexico and the southwestern United States.
**NAVIGATES BY:** Map.
**MAP?** Yes. And they create it themselves.
**HOW CAN YOU TELL?** Researchers captured 15 adult and 15 juvenile sparrows in Washington State in September, flew them to New Jersey, placed radio transmitters on their backs and let them go. The adults headed southwest, toward their known wintering grounds. The juveniles—making their first migration—flew straight south, and would have missed their goal.
**THAT'S SOME MAP:** The key, say the researchers, is that the birds automatically fly south on their first migration, and only then build a mental map of their wintering grounds that lets them return via a different route.

### MATING IN DESPERATION

In the Southwest, spadefoot toads start life in desert ponds that can dry out while they're still tadpoles. Now Karin Pfennig of the University of North Carolina has discovered an unusual strategy in a species called the plains spadefoot. In especially shallow ponds, females mate with males of another species, the Mexican spadefoot, whose tadpoles develop about three days sooner. The resulting hybrid matures more quickly than a purebred plains spadefoot, boosting survival, but it is less fertile—a trade-off.

TIMOTHY G. LAMAN / NATIONAL GEOGRAPHIC / GETTY IMAGES; KAC PRODUCTIONS / DRR.NET; DAVID ADLER; KENNETH M. HIGHFILL / PHOTO RESEARCHERS, INC.; SUZANNE L. COLLINS, CNAH

# The Coldest Place in the Universe

Physicists in Massachusetts come to grips with the lowest possible temperature: absolute zero **BY TOM SHACHTMAN**

**WHERE'S THE COLDEST SPOT** in the universe? Not on the moon, where the temperature plunges to a mere minus 378 Fahrenheit. Not even in deepest outer space, which has an estimated background temperature of about minus 455 F. As far as scientists can tell, the lowest temperatures ever attained were recently observed right here on earth.

The record-breaking lows were among the latest feats of ultracold physics, the laboratory study of matter at temperatures so mind-bogglingly frigid that atoms and even light itself behave in highly unusual ways. Electrical resistance in some elements disappears below about minus 440 F, a phenomenon called superconductivity. At even lower temperatures, some liquefied gases become "superfluids" capable of oozing through walls solid enough to hold any other sort of liquid; they even seem to defy gravity as they creep up, over and out of their containers.

Physicists acknowledge they can never reach the coldest conceivable temperature, known as absolute zero and long ago calculated to be minus 459.67 F. To physicists, temperature is a measure of how fast atoms are moving, a reflection of their energy—and absolute zero is the point at which there is absolutely no heat energy remaining to be extracted from a substance.

But a few physicists are intent on getting as close as possible to that theoretical limit, and it was to get a better view of that most rarefied of competitions that I visited Wolfgang Ketterle's lab at the Massachusetts Institute of Technology in Cambridge. It currently holds the record—at least according to *Guinness World Records 2008*—for lowest temperature: 810 trillionths of a degree F above absolute zero. Ketterle and his colleagues accomplished that feat in 2003 while working with a cloud—about a thousandth of an inch across—of sodium molecules trapped in place by magnets.

I ask Ketterle to show me the spot where they'd set the record. We put on goggles to protect ourselves from being blinded by infrared light from the laser beams that are used to slow down and thereby cool fast-moving atomic particles. We cross the hall from his sunny office into a dark room with an interconnected jumble of wires, small mirrors, vacuum tubes, laser sources and high-powered computer equipment. "Right here," he says, his voice rising with excitement as he

**Brrright idea: Wolfgang Ketterle (in his M.I.T. lab above) hopes to discover new forms of matter by studying ultracold atoms.**

RICHARD HOWARD

points to a black box that has an aluminum-foil-wrapped tube leading into it. "This is where we made the coldest temperature."

Ketterle's achievement came out of his pursuit of an entirely new form of matter called a Bose-Einstein condensate (BEC). The condensates are not standard gases, liquids or even solids. They form when a cloud of atoms—sometimes millions or more—all enter the same quantum state and behave as one. Albert Einstein and the Indian physicist Satyendra Bose predicted in 1925 that scientists could generate such matter by subjecting atoms to temperatures approaching absolute zero. Seventy years later, Ketterle, working at M.I.T., and almost simultaneously, Carl Wieman, working at the University of Colorado at Boulder, and Eric Cornell of the National Institute of Standards and Technology in Boulder created the first Bose-Einstein condensates. The three promptly won a Nobel Prize.

Lene Vestergaard Hau (in her Harvard lab) generates ultracold matter to slow and even stop beams of light.

Ketterle's team is using BECs to study basic properties of matter, such as compressibility, and better understand weird low-temperature phenomena such as superfluidity. Ultimately, Ketterle, like many physicists, hopes to discover new forms of matter that could act as superconductors at room temperature, which would revolutionize how humans use energy. For most Nobel Prize winners, the honor caps a long career. But for Ketterle, who was 44 years old when he was awarded his, the creation of BECs opened a new field that he and his colleagues will be exploring for decades.

Another contender for the coldest spot is across Cambridge, in Lene Vestergaard Hau's lab at Harvard. Her personal best is a few millionths of a degree F above absolute zero, close to Ketterle's, which she, too, reached while creating BECs. "We make BECs every day now," she says as we go down a stairwell to a lab packed with equipment. A billiards-table-size platform at the center of the room looks like a maze constructed of tiny oval mirrors and pencil-lead-thin laser beams. Harnessing BECs, Hau and her co-workers have done something that might seem impossible: they have slowed light to a virtual standstill.

**How cold is it? Though scientists have come close, they don't expect to achieve absolute zero.**

The speed of light, as we've all heard, is a constant: 186,171 miles per second in a vacuum. But it is different in the real world, outside a vacuum; for instance, light not only bends but also slows ever so slightly when it passes through glass or water. Still, that's nothing compared with what happens when Hau shines a laser beam of light into a BEC: it's like hurling a baseball into a pillow. "First, we got the speed down to that of a bicycle," Hau says. "Now it's at a crawl, and we can actually stop it—keep light bottled up entirely inside the BEC, look at it, play with it and then release it when we're ready."

She is able to manipulate light this way because the density and the temperature of the BEC slows pulses of light down. (She recently took the experiments a step further, stopping a pulse in one BEC, converting it into electrical energy, transferring it to another BEC, then releasing it and sending it on its way again.) Hau uses BECs to discover more about the nature of light and how to use "slow light"—that is, light trapped in BECs—to improve the processing speed of computers and provide new ways to store information.

Not all ultracold research is performed using BECs. In Finland, for instance, physicist Juha Tuoriniemi magnetically manipulates the cores of rhodium atoms to reach temperatures of 180 trillionths of a degree F above absolute zero. (The Guinness record notwithstanding, many experts credit Tuoriniemi with achieving even lower temperatures than Ketterle, but that depends on whether you're measuring a group of atoms, such as a BEC, or only parts of atoms, such as the nuclei.)

It might seem that absolute zero is worth trying to attain, but Ketterle says he knows better. "We're not trying," he says. "Where we are is cold enough for our experiments." It's simply not worth the trouble—not to mention, according to physicists' understanding of heat and the laws of thermodynamics, impossible. "To suck out all the energy, every last bit of it, and achieve zero energy and absolute zero—that would take the age of the universe to accomplish."

**TOM SHACHTMAN** *is the author of* Absolute Zero and the Conquest of Cold, *the basis for a future PBS "Nova" documentary.*

To learn more about absolute zero visit Smithsonian.com/phenom

RICHARD HOWARD; RANDY MAYS

OXFORD, ENGLAND

# Among the Spires

Between medieval and modern, Oxford seeks equilibrium

**BY JAN MORRIS**



**Oxford (top) is "a baffling jumble of structures . . . with no obvious center to them," says the author (above, in Wales).**

ROB MATHESON / CORBIS; COLIN MCPHERSON

THE PREMIER BELL OF OXFORD is Great Tom. Since 1684 it has hung in the tower of Christ Church, the most monumental constituent college within the University of Oxford, and every evening at five minutes past nine precisely it strikes 101 times, providing the city with a figurative tocsin.

Why 101? Because in 1546, when the college was founded, there were 100 members of the Christ Church foundation. Yes, but why 101? Oh, because in 1663 an additional student was co-opted. Why is it rung? Because in 1684, when the bell went up, the gates of the college were closed at 9 p.m. Well then, why five past nine? Because in those days, Oxford being located 1 degree 15 minutes of longitude west of the Royal Observatory at Greenwich, 9 p.m. Greenwich Mean Time was 9:05 p.m. in Oxford.

And why does it still ring like that, when Christ Church today has some 650 scholars and students, and local times have not applied in England since the 19th century? Ah, well . . . read on.

OXFORD IS the oldest university in the English-speaking world. By general consent it is one of the most distinguished, and it is not much like any other. As it would say of itself, it is sui generis—one of a kind. I have known it all my life, as a schoolchild, undergraduate, graduate and finally as an honorary fellow of my college, and I have reached the conclusion that its character depends upon an equilibrium so improbable that it amounts to an ethos all its own.

For one thing, Oxford sits in the middle of a fairly ordinary mercantile and industrial city, very unlike the ideal civic

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setting of Cambridge, England; Princeton, New Jersey; or Salamanca, Spain. For another, its buildings are a baffling jumble of structures ancient and modern, with no obvious center to them, no dominating campus or architectural pattern. And most crucially, to my mind, Universitas Oxoniensis is unique in its attitudes: eager modernity beside medieval loyalties, skepticism tempered by tradition, and the whole venerable entity spiced with anomalous quirk and absurdity.

Recently the Congregation, the university's governing body, contemplated a change in its ancient statutes that would have, for the first time, allowed outsiders to form a majority in Oxford's policymaking body. Perhaps it was hoped that a few more rich tycoons in the management might help with the raising of money for the university—which, by comparison with its American counterparts, is pitifully underfunded. I suspect it came as a relief to most Oxonians when the proposal was defeated, and the old place remained, as far as is possible in a modern unified state, master of its own affairs. But might it not mean, some asked, that old fogies of Congregation would be united in defending a general status quo? But no, the truth is that, except in matters like the eccentric ringing of bells, the university is so tangled an institution, riven by so many different purposes and even ideologies, that its corporate instincts are likely to be at least as radical as they are stick-in-the-mud.

**The venerable institution (holding its annual ceremony to bestow honorary degrees) embraces "skepticism tempered by tradition."**

For the members of Congregation include the heads of the university's constituent colleges, and there are 39 of them—at the moment (new ones often crop up). This makes for permanent creative discord. Each college is autonomous, with its own statutes, its own agendas and its own proud master, warden, president, provost, rector or dean. The prime loyalty of most Oxford alumni is not to the university but to one's college—"What college?" is the first thing any Oxford graduate says to another when they meet in boardroom or on battlefield in later life. Not so long ago it was a socially loaded inquiry, because some colleges used to be more fashionable than others, like fraternities or sororities in the United States: today inherited class has lost most of its insidious allure, even in England, even at the University of Oxford, where Stan Laurel achieved such instant and fulsome respect when (in *A Chump at Oxford*, 1940) a window fell on his head and temporarily transformed him into a peer of the realm.

The all-pervasive collegiate structure of the university powerfully complicates its affairs. If the colleges are no longer graded by social distinction, they still represent a bewildering range of aesthetic, financial or intellectual reputations. Some are very rich, owning country estates, lavishly endowed by patrons of long ago. Others, notably the former women-only colleges, bravely scratch a living, compulsorily helped along by their richer colleagues (perhaps reluctantly, too, for was it not an Oxford savant who told the female sex, in 1884: "Inferior to us God made you: and our inferiors to the end of time you will remain"?).

Built over the course of nine centuries, huggermugger amid the medieval lanes of the inner city, or spilling out toward the open country, the colleges are also an idiosyncratic display of architectural history. They are all jumble, all enclaves of privacy and style, the older ones, indeed, actually fortified against potential louts or religious zealots. To wander around them, sometimes chivied away by officious college porters, sometimes spontaneously befriended by fellows of the Royal Society, under forbidding gatehouses, up and down venerable staircases, through a mesh of quadrangles, amid the miasmas of a dozen dining halls—to wander through those 39 colleges is to feel oneself stumbling through a separate world of idiosyncrasy.

BUT RATIONALITY keeps breaking in. Without it, of course, the equilibrium would collapse, and the University of Oxford would limp along as a mere nostalgic relic. In fact, the place is in a constant state of flux.

Between the two world wars, Oxford's architecture was largely stagnant, and almost the only beautiful contemporary structure was a little footbridge over the river Cherwell. A spirit of change was signaled in 1959 when Danish architect Arne Jacobson was commissioned to design the new college of St. Catherine's, on the outskirts of the medieval center among the water-meadows to the east. He did the whole thing from scratch, from pepper shakers to bicycle racks, in purest Scandinavian Modern, the dominant style of the day.

This was bold and exciting, but not very Oxford—it lacked the requisite elements of humor and intricacy. Fortunately for my instincts, though, over the years since then the university and its colleges have been developed in a more properly muddled manner. This has been dictated, of course, not by ethos but by the exigencies of finance, planning restrictions and social progress. A sprawling new science area appeared. A particle accelerator building arose above the topsy-turvy rooftops. Where there was once an

GRAHAM HARRISON / DRR.NET

**Throughout Oxford (above, Broad Street), Morris says, "swarms a multitudinous cross section of contemporary humanity."**

old electrical power station, there is now a laboratory housing several wind tunnels. Another brand-new college, all glass and pebble dash, arose beside the Cherwell north of the old center. A big new law library materialized on one flank of the city; on the other flank, by the railway station, a Syrian-born multimillionaire sponsored the Said Business College, with a tower like a ziggurat.

Sidling in among the labyrinthine purlieus of the colleges too, sundry lesser new constructions gently remind us now that, despite its reputation, nothing in Oxford really stays the same. Squeezed between quadrangles may be a concrete dormitory, half-hidden behind a Georgian block, a modernistic new library. Put together all the buildings of Oxford that have been added during the past few decades and you would have an elegant new university of its own, complete with all faculties.

And through it all swarms a multitudinous cross section of contemporary humanity. Some 40,000 students are at large at Oxford, if it is term time, half of them from the university itself, half from the assorted educational establishments that flourish in its shadow. Another 149,000 townspeople jam the brassy shopping malls of the commercial center, and what seem to be a thousand buses from a hundred different companies parade the noble High Street. Some innocent visitors, expecting an idyllic haven of youth and contemplation, take one look at the city center and drive hastily away.

Matthew Arnold called Oxford a sweet city of dreaming spires. No longer: it is a maelstrom of varied energies, the very antithesis of tradition's ivory tower.

But so it should be, to my mind, if a university is to reflect the full range of human energy—to be, for better and for worse, a microcosm of its culture. And at the heart of it all anyway, invested by suburbs and industrial quarters, Universitas Oxoniensis pursues as always its majestically ambiguous and perhaps unconscious purpose—to remain its esoteric self but to be a vital part of the great world too.

The head of one of the greatest colleges admitted to me recently that the world had defeated him, and he could no longer cope with the relentless criteria of a modern university. It was the dreaming spires for him, and he presently retreated into a gentler field of scholarship. In a harshly competitive age, Oxford has to sell itself, and shiny indeed are the brochures, lavish the functions, flattering the honorary degrees and fellowships, endless the hospitality of such college heads, by which it solicits the means for its survival.

But survive it does. This truly remarkable engine of contemporary intellect is still able, after roughly 900 years, to attract scholars of rare distinction, students of grand promise, from the four corners of the world. A third of the University of Oxford's students, in the year 2007, come from abroad, representing 139 different countries: and there are still sufficient men and women of genius who are so attuned to the particular mores of this strange place that all the gold of the Indies cannot lure them elsewhere.

ROBERT JUDGES / ALAMY

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How does it work? God knows. The University of Oxford is such a tangle of discrete influences and loyalties, so loaded with separate authorities, so littered with boards and customs and councils and faculties and electors and visitors and trustees that picking one's way through it is like exploring a labyrinth. But work it does, and I like to think that its particular combination of the radical and the nostalgic, the dogmatic and the ecumenical, the ironic and the opportunist, the earnestly sensible and the antic illogical is what gives the place not only its ethos but its resilience.

Think of this. The most distinguished graduate college at Oxford is All Souls, founded in 1438 and popularly alleged to number among its Fellows the cleverest men and women in England. Once in every hundred years this eminent company celebrates something called the ceremony of the mallard, when it commemorates the fable of a wild duck supposed to have flown out of the foundations when the college was being built. After a good and vinous dinner those academics perambulate the premises looking for the shade of that bird, carrying sticks and staves, led by a Lord Mallard in a sedan chair with a dead duck on a pole, climbing to the roof and singing a gibberish song—Ho, the blood of King Edward, by the blood of King Edward, it was a swapping, swapping mallard.

When in 2001 they celebrated the ceremony of the mallard for the umpteenth time, they printed a booklet about the occasion. On its cover they quoted a contemporary commentator (me, as it happened!) to the effect that no event in Europe could be sillier, "not the most footling country frolic or pointless Anatolian orgy."

Inside the booklet, though, Oxford being Oxford, the Lord Mallard of the day confidently looked forward to the duck's resurrection "in future centuries."

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**JAN MORRIS**, *who lives in Wales, has written some 40 books on travel and history, including* Oxford *(1965).*

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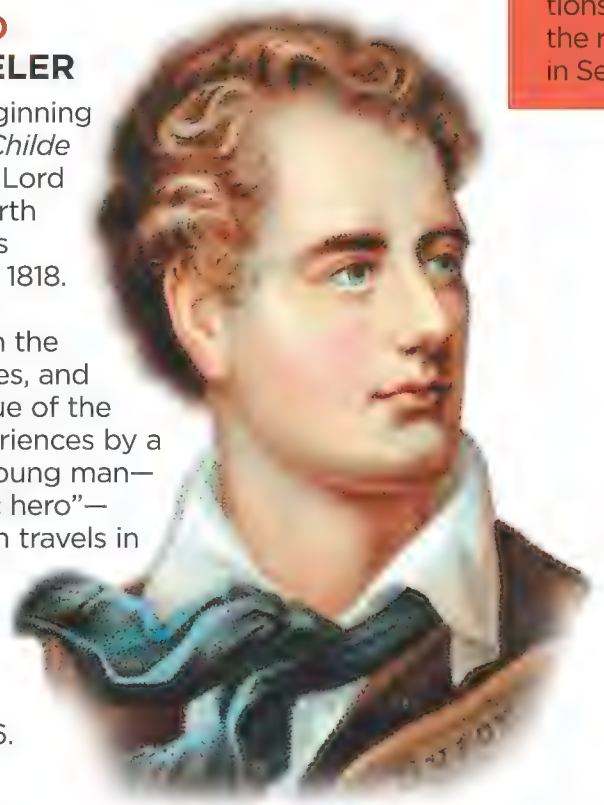
# THIS MONTH IN HISTORY

## JANUARY ANNIVERSARIES
### MOMENTOUS OR MERELY MEMORABLE

BY ALISON McLEAN

### 190 YEARS AGO
### FELLOW TRAVELER

Eight years after beginning his narrative poem *Childe Harold's Pilgrimage*, Lord Byron sends the fourth and final canto to his publisher in January 1818. "It has been to me a source of pleasure in the production," he writes, and indeed the travelogue of the search for new experiences by a smart, disaffected young man—the original "Byronic hero"—parallels Byron's own travels in Europe. The poem brings Byron fame; his romantic exploits, notoriety. The poet dies in Greece in 1824, at 36.



### 220 YEARS AGO "G'DAY, MATES"

Eleven ships, six of them convict transports, land in Port Jackson (Sydney) to found the first British penal colony in Australia in January 1788. Governor Arthur Phillip sets the rules for the new settlers: no food without work. But poor soil makes for hard labor and scarce food. The arrival of a second fleet in 1790 ensures survival, and by 1850, 162,000 convicts have come to the island continent. January 26 is Australia Day, a national holiday, viewed with mixed feelings by Australia's indigenous people.

### 160 YEARS AGO "GOLD, BOYS, GOLD!"

Contractor James Marshall finds gold flakes (an original in the National Museum of American History) in the tailrace of a sawmill he is building for John Sutter near Coloma, California, January 24, 1848. When word spreads, gold-seeking "forty-niners" raise California's nonnative population from 14,000 to 100,000 in two years. Marshall dies penniless in 1885, and Sutter, his men gone prospecting and his land full of squatters, goes bankrupt. He dies in 1880, at 77.



### 60 YEARS AGO
### FLEETINGLY FREE

After more than 60 years as a British colony, Burma gains independence January 4, 1948, a year after negotiations by nationalist leader Aung San. The new republic is stirred by insurgent communist groups and ethnic minorities, and a 1962 coup ushers in a repressive socialist state, which is itself taken over by a military junta in 1988. Despite protests by Aung San's daughter, Aung San Suu Kyi, and elections in 1990, Burma, now calling itself Myanmar, remains under the rule of the junta—whose crackdown on monk-led protests in September 2007 ended in at least nine deaths.

### 230 YEARS AGO
### HAWAIIAN HIDEAWAY

While seeking a Pacific entry to the Northwest Passage in January 1778, British explorer Capt. James Cook finds something else: Hawaii. He and his crew are the first Europeans to set foot on the islands—which he dubs Sandwich after the fourth earl. Cook returns the next winter but is killed by islanders in a fight. In 2006, Hawaii, a state since 1959, hosts 104,000 visiting Europeans—and five million Americans.

### 75 YEARS AGO
### WHO WAS THAT MASKED MAN?

A mystery rider on a fiery horse clears a man wrongfully accused of murder in the January 30, 1933, première of *The Lone Ranger,* on Detroit's WXYZ radio. Written by Fran Striker and played live by several actors over some 3,000 episodes (Brace Beemer, above, wore the mask from 1941 to 1954), the Ranger—with his Indian friend Tonto—airs on some 400 radio stations, and spurs movie serials, a TV show (starring Clayton Moore), books, comics and a romantic notion of the American West.

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# People with COPD breathe better with SPIRIVA.

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- Is not a steroid

Please see brief summary of full Prescribing Information on reverse.

SPIRIVA does not replace fast-acting inhalers for sudden symptoms. Do not swallow the SPIRIVA capsule. The most common side effect of SPIRIVA is dry mouth. Others include constipation and problems passing urine. Tell your doctor about your medicines, including eye drops, and illnesses like glaucoma and urinary or prostate problems. These may worsen with SPIRIVA. If you have vision changes, eye pain, your breathing suddenly worsens, you get hives, or your throat or tongue swells, stop taking SPIRIVA and contact your doctor. For more information, call 1.877.SPIRIVA or visit spiriva.com

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SPIRIVA® HandiHaler®
(tiotropium bromide inhalation powder)

# SPIRIVA® HandiHaler®
## (tiotropium bromide inhalation powder)

**Spiriva® HandiHaler®** (tiotropium bromide inhalation powder)
**FOR ORAL INHALATION ONLY**
**Brief Summary of Prescribing Information**

**INDICATIONS AND USAGE**
SPIRIVA HandiHaler (tiotropium bromide inhalation powder) is indicated for the long-term, once-daily, maintenance treatment of bronchospasm associated with chronic obstructive pulmonary disease (COPD), including chronic bronchitis and emphysema.

**CONTRAINDICATIONS**
SPIRIVA HandiHaler (tiotropium bromide inhalation powder) is contraindicated in patients with a history of hypersensitivity to atropine or its derivatives, including ipratropium, or to any component of this product.

**WARNINGS**
SPIRIVA HandiHaler (tiotropium bromide inhalation powder) is intended as a once-daily maintenance treatment for COPD and is not indicated for the initial treatment of acute episodes of bronchospasm, i.e., rescue therapy.

Immediate hypersensitivity reactions, including angioedema, may occur after administration of SPIRIVA. If such a reaction occurs, therapy with SPIRIVA should be stopped at once and alternative treatments should be considered.

Inhaled medicines, including SPIRIVA, may cause paradoxical bronchospasm. If this occurs, treatment with SPIRIVA should be stopped and other treatments considered.

**PRECAUTIONS**
**General**
As an anticholinergic drug, SPIRIVA (tiotropium bromide inhalation powder) may potentially worsen symptoms and signs associated with narrow-angle glaucoma, prostatic hyperplasia or bladder-neck obstruction and should be used with caution in patients with any of these conditions.

As a predominantly renally excreted drug, patients with moderate to severe renal impairment (creatinine clearance of ≤50 mL/min) treated with SPIRIVA should be monitored closely (see **CLINICAL PHARMACOLOGY, Pharmacokinetics, Special Populations**, *Renally-impaired Patients*).

**Information for Patients**
It is important for patients to understand how to correctly administer SPIRIVA capsules using the HandiHaler inhalation device (**see Patient's Instructions for Use**). SPIRIVA capsules should only be administered via the HandiHaler device and the HandiHaler device should not be used for administering other medications.

Capsules should always be stored in sealed blisters. Remove only one capsule immediately before use, or its effectiveness may be reduced. Additional capsules that are exposed to air (i.e., not intended for immediate use) should be discarded.

Eye pain or discomfort, blurred vision, visual halos or colored images in association with red eyes from conjunctival congestion and corneal edema may be signs of acute narrow-angle glaucoma. Should any of these signs and symptoms develop, consult a physician immediately. Miotic eye drops alone are not considered to be effective treatment.

Care must be taken not to allow the powder to enter into the eyes as this may cause blurring of vision and pupil dilation.

SPIRIVA HandiHaler is a once-daily maintenance bronchodilator and should not be used for immediate relief of breathing problems, i.e., as a rescue medication.

**Drug Interactions**
SPIRIVA has been used concomitantly with other drugs commonly used in COPD without increases in adverse drug reactions. These include sympathomimetic bronchodilators, methylxanthines, and oral and inhaled steroids. However, the co-administration of SPIRIVA with other anticholinergic-containing drugs (e.g., ipratropium) has not been studied and is therefore not recommended.

**Drug/Laboratory Test Interactions**
None known.

**Carcinogenesis, Mutagenesis, Impairment of Fertility**
No evidence of tumorigenicity was observed in a 104-week inhalation study in rats at tiotropium doses up to 0.059 mg/kg/day, in an 83-week inhalation study in female mice at doses up to 0.145 mg/kg/day, and in a 101-week inhalation study in male mice at doses up to 0.002 mg/kg/day. These doses correspond to 25, 35, and 0.5 times the Recommended Human Daily Dose (RHDD) on a mg/m$^2$ basis, respectively. These dose multiples may be over-estimated due to difficulties in measuring deposited doses in animal inhalation studies.

Tiotropium bromide demonstrated no evidence of mutagenicity or clastogenicity in the following assays: the bacterial gene mutation assay, the V79 Chinese hamster cell mutagenesis assay, the chromosomal aberration assays in human lymphocytes *in vitro* and mouse micronucleus formation *in vivo*, and the unscheduled DNA synthesis in primary rat hepatocytes *in vitro* assay.

In rats, decreases in the number of corpora lutea and the percentage of implants were noted at inhalation tiotropium doses of 0.078 mg/kg/day or greater (approximately 35 times the RHDD on a mg/m$^2$ basis). No such effects were observed at 0.009 mg/kg/day (approximately 4 times than the RHDD on a mg/m$^2$ basis). The fertility index, however, was not affected at inhalation doses up to 1.689 mg/kg/day (approximately 760 times the RHDD on a mg/m$^2$ basis). These dose multiples may be over-estimated due to difficulties in measuring deposited doses in animal inhalation studies.

**Pregnancy**
*Pregnancy Category C*

No evidence of structural alterations was observed in rats and rabbits at inhalation tiotropium doses of up to 1.471 and 0.007 mg/kg/day, respectively. These doses correspond to approximately 660 and 6 times the recommended human daily dose (RHDD) on a mg/m$^2$ basis. However, in rats, fetal resorption, litter loss, decreases in the number of live pups at birth and the mean pup weights, and a delay in pup sexual maturation were observed at inhalation tiotropium doses of ≥0.078 mg/kg (approximately 35 times the RHDD on a mg/m$^2$ basis). In rabbits, an increase in post-implantation loss was observed at an inhalation dose of 0.4 mg/kg/day (approximately 360 times the RHDD on a mg/m$^2$ basis). Such effects were not observed at inhalation doses of 0.009 and up to 0.088 mg/kg/day in rats and rabbits, respectively. These doses correspond to approximately 4 and 80 times the RHDD on a mg/m$^2$ basis, respectively. These dose multiples may be over-estimated due to difficulties in measuring deposited doses in animal inhalation studies.

There are no adequate and well-controlled studies in pregnant women. SPIRIVA should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

**Use in Labor and Delivery**
The safety and effectiveness of SPIRIVA has not been studied during labor and delivery.

**Nursing Mothers**
Clinical data from nursing women exposed to tiotropium are not available. Based on lactating rodent studies, tiotropium is excreted into breast milk. It is not known whether tiotropium is excreted in human milk, but because many drugs are excreted in human milk and given these findings in rats, caution should be exercised if SPIRIVA is administered to a nursing woman.

**Pediatric Use**
SPIRIVA HandiHaler is approved for use in the maintenance treatment of bronchospasm associated with chronic obstructive pulmonary disease, including chronic bronchitis and emphysema. This disease does not normally occur in children. The safety and effectiveness of SPIRIVA in pediatric patients have not been established.

**Geriatric Use**
Of the total number of patients who received SPIRIVA in the 1-year clinical trials, 426 were <65 years, 375 were 65–74 years and 105 were ≥75 years of age. Within each age subgroup, there were no differences between the proportion of patients with adverse events in the SPIRIVA and the comparator groups for most events. Dry mouth increased with age in the SPIRIVA group (differences from placebo were 9.0%, 17.1%, and 16.2% in the aforementioned age subgroups). A higher frequency of constipation and urinary tract infections with increasing age was observed in the SPIRIVA group in the placebo-controlled studies. The differences from placebo for constipation were 0%, 1.8%, and 7.8% for each of the age groups. The differences from placebo for urinary tract infections were −0.6%, 4.6% and 4.5%. No overall differences in effectiveness were observed among these groups. Based on available data, no adjustment of SPIRIVA dosage in geriatric patients is warranted.

**ADVERSE REACTIONS**
Of the 2,663 patients in the four 1-year and two 6-month controlled clinical trials, 1,308 were treated with SPIRIVA (tiotropium bromide inhalation powder) at the recommended dose of 18 mcg once a day. Patients with narrow angle glaucoma, or symptomatic prostatic hypertrophy or bladder outlet obstruction were excluded from these trials.

The most commonly reported adverse drug reaction was dry mouth. Dry mouth was usually mild and often resolved during continued treatment. Other reactions reported in individual patients and consistent with possible anticholinergic effects included constipation, increased heart rate, blurred vision, glaucoma, urinary difficulty, and urinary retention.

Four multicenter, 1-year, controlled studies evaluated SPIRIVA in patients with COPD. Table 1 shows all adverse events that occurred with a frequency of ≥3% in the SPIRIVA group in the 1-year placebo-controlled trials where the rates in the SPIRIVA group exceeded placebo by ≥1%. The frequency of corresponding events in the ipratropium-controlled trials is included for comparison.

**Table 1: Adverse Experience Incidence (% Patients) in One-Year-COPD Clinical Trials**

| Body System (Event) | Placebo-Controlled Trials | | Ipratropium-Controlled Trials | |
|---|---|---|---|---|
| | SPIRIVA [n = 550] | Placebo [n = 371] | SPIRIVA [n = 356] | Ipratropium [n = 179] |
| **Body as a Whole** | | | | |
| Accidents | 13 | 11 | 5 | 8 |
| Chest Pain (non-specific) | 7 | 5 | 5 | 2 |
| Edema, Dependent | 5 | 4 | 3 | 5 |
| **Gastrointestinal System Disorders** | | | | |
| Abdominal Pain | 5 | 3 | 6 | 6 |
| Constipation | 4 | 2 | 1 | 1 |
| Dry Mouth | 16 | 3 | 12 | 6 |
| Dyspepsia | 6 | 5 | 1 | 1 |
| Vomiting | 4 | 2 | 1 | 2 |
| **Musculoskeletal System** | | | | |
| Myalgia | 4 | 3 | 4 | 3 |
| **Resistance Mechanism Disorders** | | | | |
| Infection | 4 | 3 | 1 | 3 |
| Moniliasis | 4 | 2 | 3 | 2 |
| **Respiratory System (upper)** | | | | |
| Epistaxis | 4 | 2 | 1 | 1 |
| Pharyngitis | 9 | 7 | 7 | 3 |
| Rhinitis | 6 | 5 | 3 | 2 |
| Sinusitis | 11 | 9 | 3 | 2 |
| Upper Respiratory Tract Infection | 41 | 37 | 43 | 35 |
| **Skin and Appendage Disorders** | | | | |
| Rash | 4 | 2 | 2 | 2 |
| **Urinary System** | | | | |
| Urinary Tract Infection | 7 | 5 | 4 | 2 |

Arthritis, coughing, and influenza-like symptoms occurred at a rate of ≥3% in the SPIRIVA treatment group, but were <1% in excess of the placebo group.

Other events that occurred in the SPIRIVA group at a frequency of 1–3% in the placebo-controlled trials where the rates exceeded that in the placebo group include: *Body as a Whole:* allergic reaction, leg pain; *Central and Peripheral Nervous System:* dysphonia, paresthesia; *Gastrointestinal System Disorders:* gastrointestinal disorder not otherwise specified (NOS), gastroesophageal reflux, stomatitis (including ulcerative stomatitis); *Metabolic and Nutritional Disorders:* hypercholesterolemia, hyperglycemia; *Musculoskeletal System Disorders:* skeletal pain; *Cardiac Events:* angina pectoris (including aggravated angina pectoris); *Psychiatric Disorder:* depression; *Infections:* herpes zoster; *Respiratory System Disorder (Upper):* laryngitis; *Vision Disorder:* cataract. In addition, among the adverse events observed in the clinical trials with an incidence of <1% were atrial fibrillation, supraventricular tachycardia, angioedema, and urinary retention.

In the 1-year trials, the incidence of dry mouth, constipation, and urinary tract infection increased with age (see **PRECAUTIONS, Geriatric Use**).

Two multicenter, 6-month, controlled studies evaluated SPIRIVA in patients with COPD. The adverse events and the incidence rates were similar to those seen in the 1-year controlled trials.

The following adverse reactions have been identified during worldwide post-approval use of SPIRIVA: dizziness, dysphagia, epistaxis, hoarseness, intestinal obstruction including ileus paralytic, intraocular pressure increased, oral candidiasis, palpitations, pruritus, tachycardia, throat irritation, and urticaria.

**DOSAGE AND ADMINISTRATION**
The recommended dosage of SPIRIVA HandiHaler (tiotropium bromide inhalation powder) is the inhalation of the contents of one SPIRIVA capsule, once-daily, with the HandiHaler inhalation device (see **Patient's Instructions for Use**).

No dosage adjustment is required for geriatric, hepatically-impaired, or renally-impaired patients. However, patients with moderate to severe renal impairment given SPIRIVA should be monitored closely (see **CLINICAL PHARMACOLOGY, Pharmacokinetics, Special Populations** and **PRECAUTIONS**).

SPIRIVA capsules are for inhalation only and must not be swallowed.

**HOW SUPPLIED**
The following packages are available:

carton containing 5 SPIRIVA capsules (1 unit-dose blister card) and 1 HandiHaler inhalation device (NDC 0597-0075-75)

carton containing 30 SPIRIVA capsules (3 unit-dose blister cards) and 1 HandiHaler inhalation device (NDC 0597 0075-41)

carton containing 90 SPIRIVA capsules (9 unit-dose blister cards) and 1 HandiHaler inhalation device (NDC 0597 0075-47)

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# Around the Mall

## SCENES AND SIGHTINGS FROM THE SMITHSONIAN MUSEUMS AND BEYOND

STEPHEN VOSS / WPN


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# MORE THAN MARLEY

THE RASTAFARIAN WAY OF LIFE IS NOT JUST ABOUT SINGING REGGAE. AN UNPRECEDENTED EXHIBITION AT THE NATURAL HISTORY MUSEUM EXPLORES THE ORIGINS OF A MOVEMENT THAT HAS MORE THAN ONE MILLION FOLLOWERS

PAGE 34

Curator Jake Homiak (right) and adviser Ras Maurice Clarke make the sign of the trinity, a Rastafarian symbol of reverence.

FROM THE CASTLE

# Aero Dynamic

**BY CRISTIÁN SAMPER**

UNTIL YOU'VE STOOD at the front landing gear, right beneath the nose of a Boeing 747, you don't realize how colossal the first "jumbo jet" is. Now you can do just that, then go up a long escalator and walk into the cockpit, thanks to Northwest Airlines, which donated a 747 nose section to the new "America by Air" gallery at the National Air and Space Museum. A century ago, passenger air travel didn't exist; now hundreds of millions of people worldwide fly every year—an astonishing technological triumph. Almost fourteen hundred 747s have been built; they have revolutionized travel by making even intercontinental trips widely affordable.

Through seven complete airplanes and many other artifacts, simulators and interactive displays, this fascinating gallery tells the dynamic story of air travel in America, from the earliest, fairly primitive aircraft to today's supersleek, ultracomfortable behemoths. A four-part narrative (The Early Years of Air Transportation, 1914-1927; Airline Expansion and Innovation, 1927-1941; The Heyday of Propeller Airliners, 1941-1958; and The Jet Age, 1958 to today) takes visitors through time as they experience a Ford Tri-Motor's numbing noise and shudder, a luxurious Douglas DC-7 interior and an Airbus A320 cockpit simulator during a takeoff and landing.

**A spectacular new gallery at the Air and Space Museum (the nose of a 747) charts the history of an astonishing triumph—air travel.**

America's airline industry began May 15, 1918, when a tiny biplane loaded with mail clawed its way skyward from a Washington, D.C. polo field. The plane was destined for New York City but headed south in error and landed in a Maryland field. Despite this unpromising start, the U.S. Air Mail Service was born; by the late 1920s, mail delivery was turned over to commercial carriers, which evolved into today's airlines.

Changing uniform designs help tell the air travel story too, as for example, 1950s military styles gave way to the wildly colorful uniforms of the turbulent 1960s. Among the many interactive displays, animated maps on high-definition screens present a compressed bird's-eye view of today's complex airline routes and the effects of bad weather. The same displays show how air traffic control cleared the skies over the United States on Sept. 11, 2001, in just a few hours of unprecedented activity.

The technological developments, safety and convenience in air travel are a direct result of government and business cooperation, particularly in the work of the National Advisory Committee for Aeronautics and its successor, the National Aeronautics and Space Administration—NASA—the primary sponsor of "America by Air." If you can't come to Washington right away to see it, take a virtual tour at http://www.nasm.si.edu/americabyair/.

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**CRISTIÁN SAMPER** *is Acting Secretary of the Smithsonian Institution.*

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# Rasta Revealed

## A reclamation of African identity evolved into a worldwide cultural, religious and political movement

THE MOST recognizable face of the Rastafari movement is the late musician Bob Marley, immortalized on T-shirts and posters wearing a crocheted red, gold and green cap over natty dreadlocks in a cloud of marijuana smoke. Yet the movement, which has more than one million adherents, is "not about singing reggae," says Jake Homiak, a cultural anthropologist at the Smithsonian's National Museum of Natural History. "It taps into an enormously deep root—a sense of longing for a place in the world by peoples of African descent."

**Rastafarians see Ethiopian emperor Haile Selassie I (above, in 1955) as their messiah.**

Homiak, who has immersed himself in the culture for 30 years, is the curator of the recently opened exhibit "Discovering Rastafari!" Nearly 20 Rastafarians consulted on all details of the exhibition, the first of its kind in any major museum.

The exhibit recounts an intricate history and imparts nuance to a movement that celebrates African liberation, global peace and "one love." Its origins can be traced to a biblical passage: "Princes shall come out of Egypt; Ethiopia shall soon stretch forth her hands unto God," reads Psalm 68:31. Enslaved Africans in the American colonies believed this foretold their emancipation. In the 20th century, Jamaican black nationalist leader Marcus Garvey frequently cited the passage, predicting that a savior would be crowned in Africa.

On November 2, 1930, that prophecy appeared to be fulfilled when Ras (an Ethiopian title of nobility) Tafari Makonnen—believed to be a descendant of the Queen of Sheba and King Solomon—was crowned Emperor Haile Selassie I of Ethiopia. Black preachers in Jamaica saw the event as the second coming of Christ. Selassie was a charismatic figure who captivated audiences worldwide, as when he declared before the United Nations in 1963, "Until the color of a man's skin is of no more significance than the color of his eyes . . . the dream of lasting peace . . . will remain but a fleeting illusion." He ruled Ethiopia until 1974, when he was deposed by Marxist revolutionaries. Selassie died a year later, although many Rastafarians remain firm in the belief that he is still alive.

"This is a faith of extraordinary commitment," says Homiak, who describes how early Rastafarians in Jamaica were beaten and publicly humiliated. "People have sacrificed and struggled to keep this faith alive." A glass case at the Smithsonian exhibit displays such manuscripts as the *Holy Piby*, a proto-Rastafarian text that was widely circulated across the African diaspora before being banned in Jamaica during the 1920s.

One of the exhibit's advisers, Ras Maurice Clarke—a Rastafarian originally from Kingston, Jamaica, who now lives in Washington, D.C.—says that he wanted to "dispel the ignorance and fictitious talk about all we do is smoke ganja." Because the advisers were wary of stereotypes, they debated whether to feature Marley in the exhibit. Ultimately, they included a small tribute to the king of reggae. "It made no sense to do an exhibit on Rastafari and exclude the person who was the most famous purveyor of the Rastafari philosophy," Homiak says.

Selassie's messages of liberation and unity are paramount in Marley's music, as well as in the lives of Rastafarians today. Empress (a title bestowed on a mother) Melanie Wright, who came from Hartford, Connecticut, with her family to be at the opening, says that she found her calling on the streets of New York after seeing countless posters of Selassie: "He fought for the freedom of Africa, so part of saying you're Rastafari means you're living to reclaim that history." { BY JESS BLUMBERG }

## MAKING HISTORY

**GIVING BACK** More than a century after Sitting Bull's death, some of his last possessions are going home. As of press time, the National Museum of Natural History announced plans to repatriate a lock of the famed Sioux chief's hair and his wool leggings to his closest living relatives, as required by the National Museum of the American Indian Act. History remembers Sitting Bull as both a spiritual and military leader who took up arms when his people were forced off tribal lands. In 1890, after he was fatally shot by Native American police, his body was taken into custody at Fort Yates in North Dakota, where an Army doctor obtained the hair and leggings and sent them to the museum in 1896. For the past five years, Bill Billeck, director of the museum's Repatriation Office, has been searching for Sitting Bull's descendants. He determined that Ernie LaPointe (above) of Lead, South Dakota, his three sisters and their children and grandchildren are the closest living relatives. "I think the circle of the death of Sitting Bull will now be completed," LaPointe says. { JB }

For extensive reporting on the repatriation, go to Smithsonian.com/sittingbull

Learn more from Jake Homiak and sample traditional music at Smithsonian.com/rastafari

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THE OBJECT AT HAND

# Explorer I Satellite

NATIONAL AIR AND SPACE MUSEUM

## SPACE RACE

### In 1958, Explorer 1 launched America's response to the USSR's Sputnik

**BY OWEN EDWARDS**

IT WAS, QUITE LITERALLY, the beep heard round the world. The sound, mildly annoying and profoundly unnerving, was beamed to earth from a small metal sphere called *Sputnik*, launched into space by Russia on October 4, 1957.

As the satellite circled the planet 14 times a day, the small, persistent ping came as a shock to most Americans, who had been lulled into thinking that Russia was inferior to the United States in every way, and certainly in science and engineering. The space race was on. Less than four months later, the spacecraft *Explorer I*—launched 50 years ago, on January 31, 1958—would become America's answer to the new challenge. The slender black-and-white projectile, less than seven feet long, now hangs in the Smithsonian's National Air and Space Museum (NASM).

"In an age when we send massive payloads into orbit, *Explorer* looks primitive," says NASM curator Roger Launius, "because it's so small, and its instruments are so unsophisticated." Nevertheless, as proof that the United States could run with the Soviets, *Explorer* was huge. Getting into the game was far from a smooth process, however, and gaining the lead in the race took years.

The American rocketry elite, including an Army-funded team led by the German (and former Nazi) aerospace engineer Wernher von Braun, may have been chagrined at losing face to the USSR but could not have been surprised. The competition, in fact, had been conducted without much fanfare since shortly after the end of World War II. (As for von Braun, his past, while not unknown, was glossed over by U.S. officials until after his death in 1977.)

While the public and some in the U.S. government were shaken by *Sputnik*, recently declassified documents from the period show that President Dwight D. Eisenhower, aided by the CIA's secret U-2 flights over the Soviet Union, was well-informed on Russian progress. As a former military leader who valued intelligence, Eisenhower had long been determined to put spy satellites into orbit. The president kept his knowledge and his plans secret; at the time, his lack of panic was interpreted by many as indifference. "They thought he was asleep at the switch," historian Michael Neufeld, a curator at NASM, said in a recent PBS "Nova" series documentary, "Sputnik Declassified." (Eisenhower, in fact, presided over the launching of the first spy satellites in 1960, an accomplishment for which he never took credit.)

**Inconvenient truth: Von Braun (with *Explorer* in 1958) had once guided Hitler's V-2 rockets.**

One hundred and twenty days after the launch of *Sputnik*, von Braun and his scientists sent a Jupiter-C rocket, carrying the 30-pound *Explorer,* into an elliptical orbit. Though the lofting of satellites by the two great powers bore the legitimizing stamp of geophysical research, and *Explorer*'s instruments detected the Van Allen radiation belt of charged particles circling earth, the launches unmistakably demonstrated the muscle behind the two nations' science.

*Explorer* stayed in orbit for many years before burning up on reentry in 1970. (The Smithsonian's was a backup; its *Sputnik*, however, is a replica.)

*Explorer* and *Sputnik* have enabled advances from satellite communications to the tracking of hurricanes to global positioning technology. "*Sputnik* did not lead to the Apollo program directly, although it set the context," says Neufeld. "It took more Soviet firsts and a change of administration . . . to lead to the moon decision. As for reconnaissance satellites, *Sputnik* accelerated their appearance, certainly; from that point on, investment was continuous and massive. We didn't do one or the other, we did both."

---

**OWEN EDWARDS** *is a freelance writer and author of the book* Elegant Solutions.

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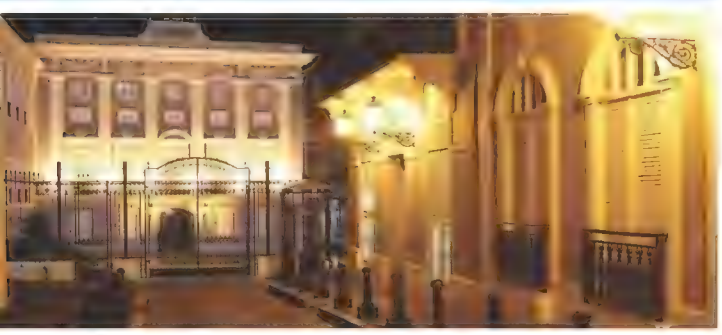
**San Felipe del Morro Fort** - A sixteenth-century citadel which lies on the northwestern-most point of the islet of San Juan. Named in honor of King Philip II of Spain, the Fort, was designed to guard the entrance to San Juan Bay, and defend the city of San Juan from seaborne enemies.

**San Cristóbal Fort** - The largest fortification built by the Spanish in the New World. Originally it covered about 27 acres of land, basically wrapping the city of San Juan. Entry to the city was sealed by San Cristóbal's double gates. After close to one hundred years of peace in the area, part of the fortification was demolished to help ease the flow of traffic in and out of the walled city.

**San Juan Bautista Cathedral** – The original structure was begun in 1521, destroyed by a storm in 1526, and rebuilt in 1529. It is the last resting place of Juan Ponce de León.



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# Q&A

Architect **NORMAN FOSTER** designed the glass canopy at the Smithsonian's Reynolds Center for American Art and Portraiture. He spoke with Jess Blumberg.

**THE COURTYARD AT THE REYNOLDS CENTER APPEARS BRIGHTER THAN EVER.** I'm intrigued that you felt there was more light. When you do modify a space, you transform it in terms of all of the senses. It not only feels different in terms of climate—it also smells, sounds and feels different in ways that you can't define.

**YOU WANTED THE CANOPY "TO LOOK LIKE A CLOUD SETTLING OVER THE COURTYARD."** It is a change in the life of the building. Unlike some courtyards, where you glaze them over, here you couldn't rest the new glass ceiling on the existing walls. This is something that, ideally, can float above the building supported on columns. You had to create support because of the nature of the building. We worked at great pains to preserve that.

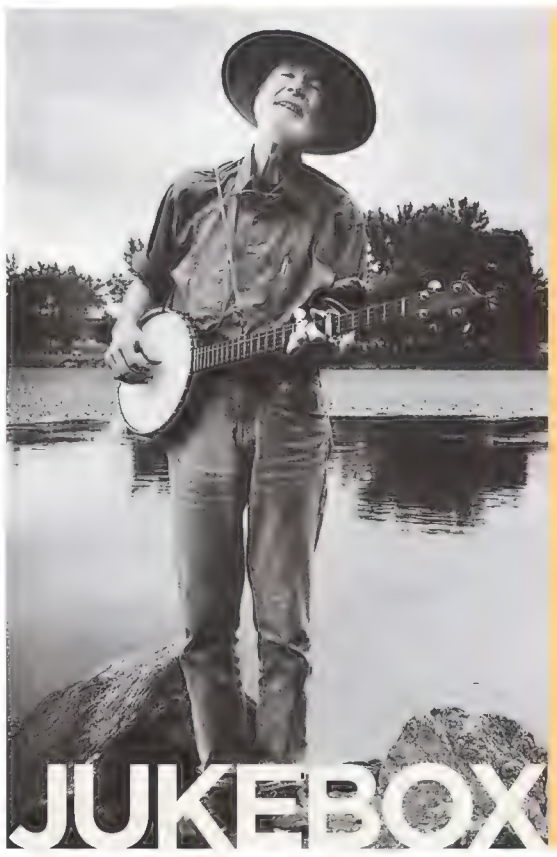
The courtyard at the Reynolds Center opened in November to critical praise.

**YOUR CAREER COVERS 40 YEARS. WHAT HAS BEEN YOUR FAVORITE DESIGN?** It's like asking somebody about their favorite child [laughs]. I can say that some buildings do stand out because they address more issues than others.

**SUCH AS?** The Reichstag, for example, is completely powered by renewable forms of energy. So, it's an energy manifesto. But it's also a political manifesto in the sense that it retains the history of the past—it doesn't cover it up for good or for bad. It establishes a new relationship between the body politic and the public.

**WHAT ARE YOU WORKING ON NOW?** I just got back from Beijing where the [Beijing Capital International] airport is near completion, which is the largest building that's ever been undertaken on the planet, so it's truly epic in scale.

Visit Smithsonian.com/foster to read more of our interview with Norman Foster




**SEEGER SINGALONG** The legendary folk singer Pete Seeger once said he wanted to "put a song on people's lips, instead of just in their ear." During the dawning years of the urban folk revival (1957-62), Folkways Records released Seeger's five-record series *American Favorite Ballads*, which encouraged a new generation to sing along to classic 19th-century tunes. Now, Folkways has reissued the albums, including previously unreleased material such as "Strawberry Roan," a ditty about a broncobuster who finally meets the horse that can throw him. Hear the track, which is on the series' fifth and final album, at Smithsonian.com/jukebox. { JB }

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# What's Up

**GOLD DIGGING** Vani, in modern-day Georgia, was a rich metropolis between the sixth and first centuries B.C. The lavish contents (such as this gold necklace) of a grave site excavated in 2004 are at the Sackler through February 24.

### SPANISH INFLUENCE

From the Revolution to the Mexican-American War, Spain played a key role in U.S. history. The Portrait Gallery displays 72 portraits (Goya's *Carlos IV*) and documents from 1763 to 1848 through February 10.

### PRIVATE SCREENINGS

During Japan's Edo period (1615-1868), the country secluded itself from the rest of the world and creative arts flourished. More than 100 hanging scrolls (*Tiger*, 1755), screens and fans, which are part of the private Etsuko and Joe Price Collection of Corona del Mar, California, are on display at the Sackler through April 13.

### ARTS AND AIRCRAFTS

The exhaust pipe of a McDonnell F-4S Phantom II jet gazes cross-eyed, thanks to Air and Space Museum photographer Carolyn Russo. See more of her work in her new book, *In Plane View: Abstractions of Flight*.

### APOCALYPSE NOW

John Alexander's 10- by 22-foot painting *I've Been Living in a Hydrogen Bomb* (1982) evokes the trauma of a nuclear attack. His powerful works are at American Art through March 16.

{ BY JESS BLUMBERG }

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GEORGIA NATIONAL MUSEUM; COLECCIÓN ALTADIS / NPG, SI; ETSUKO AND JOE PRICE COLLECTION / SACKLER GALLERY, SI; CAROLYN RUSSO / NASM, SI / POWERHOUSE BOOKS; RANDY LERNER, EAST HAMPTON, NY / SAAM



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# 1908

## Aeroplanes! Skyscrapers! The race to the North Pole! Mobile phones? Return to the year when astonishing inventions, predictions, stunts and breakthroughs propelled America into the modern age

**BY JIM RASENBERGER**

"Anything, everything, is possible."

—Thomas Edison, 1908

THE YEAR 1908 began at midnight when a 700-pound "electric ball" fell from the flagpole atop the *New York Times* building—the first-ever ball-drop in Times Square. It ended 366 days later (1908 was a leap year) with a nearly two-and-a-half-hour flight by Wilbur Wright, the longest ever made in an airplane. In the days between, the U.S. Navy's Great White Fleet sailed around the world, Adm. Robert Peary began his conquest of the North Pole, Dr. Frederick Cook reached the North Pole (or claimed to), six automobiles set out on a 20,000-mile race from New York City to Paris, and the Model T went into production at Henry Ford's plant in Detroit, Michigan.

The events and innovations that occurred within that 12-month frame a century ago marked, in many ways, America's entry into the modern world. In some cases, they quite literally put modern America in motion. Whether practically significant or, like the automobile race around the world, essentially frivolous—a "splendid folly," one contestant called it—all reflected, and expanded, Americans' sense of what was possible. Buoyed by achievements, the country was more confident in its genius and resourcefulness—not to mention its military might—and more comfortable playing a dominant role in global affairs.

Nineteen hundred eight was an election year, and the paral-

**The year's prime movers included President Theodore Roosevelt (above) and opposite (clockwise from top), radio pioneers Edouard Branly and Guglielmo Marconi; the Wright Flyer; Orville and Wilbur Wright; the Model T; a mobile phone user of the future; Jack Johnson; and the Singer Building.**

JERRY TAVIN / EVERETT COLLECTION; P. 43 WILLIAM DUKE PHOTO ILLUSTRATION COMPOSED OF THE FOLLOWING IMAGES: STEFANO BIANCHETTI / CORBIS (BRANLY & MARCONI); BETTMANN / CORBIS (AIRPLANE); LIBRARY OF CONGRESS (WRIGHT BROTHERS); LAKE COUNTY MUSEUM / CORBIS (BUILDING); NEW YORK PUBLIC LIBRARY (BOXER); HARPER'S WEEKLY (MAN); BETTMANN / CORBIS (CAR)

MARCO

Ford

**Showcasing America's military might, Roosevelt dispatched 16 U.S. Navy battleships on a world tour—"the greatest fleet of war vessels ever assembled," said the *New York Times*.**

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lels between it and 2008 are interesting. Americans of 1908 were coming off two terms of a Republican president who had abruptly set their country on a new course. He was a wealthy Ivy League-educated Easterner who had gone west as a young man and made himself into a cowboy. Like George Walker Bush, Theodore Roosevelt had entered the White House without winning the popular vote (an assassination put TR into office), then conducted himself with unapologetic force. And it was clear then, as it is now, that the country was heading into a new world defined by as yet unwritten rules, and that the man about to exit office bore not a little responsibility for this.

Americans of 1908 knew they lived in unusual times. And lest they forget, the newspapers reminded them almost daily. According to the press, everything that happened that year was bigger, better, faster and stranger than anything that had happened before. In part, this was typical newspaper hyperbole; in part, it was simply true.

An essay in the *New York World* on New Year's Day of 1908 articulated the wonderment shared by many. The article, titled "1808-1908-2008," noted how far the country had progressed over the previous century. In 1808, five years after the Louisiana Purchase and two years after Lewis and Clark returned from their transcontinental journey, the population had been a mere seven million souls. The federal government had been underfunded and ineffectual. Technology—transportation, communication, medicine, agriculture, manufacturing—had been barely more advanced than during the Middle Ages of Europe. Now, in 1908, with the U.S. population at almost 90 million, the federal revenue was 40 times greater than it had been a century earlier, and America was on a par with Britain and Germany as a global power. U.S. citizens enjoyed the highest per capita income in the world and were blessed with railroads and automobiles, telegraph and telephone, electricity and gas. Men shaved their whiskers with disposable razor blades and women tidied their homes with remarkable new devices called vacuum cleaners. Couples danced to the Victrola in their living rooms and snuggled in dark theaters to watch the flickering images of the Vitagraph. Invisible words volleyed across the oceans between the giant antennas of Marconi's wireless telegraph, while American engineers cut a 50-mile canal through the Isthmus of Panama.

Adapted from *America, 1908* by Jim Rasenberger. Copyright © Jim Rasenberger. Reprinted by permission of Scribner, an imprint of Simon & Schuster, Inc., NY.

From the glories of the present the *World* turned to the question of the future: "What will the year 2008 bring us? What marvels of development await the youth of tomorrow?" The U.S. population of 2008, the newspaper predicted, would be 472 million (it's 300 million). "We may have gyroscopic trains as broad as houses swinging at 200 miles an hour up steep grades and around dizzying curves. We may have aeroplanes winging the once inconquerable air. The tides that ebb and flow to waste may take the place of our spent coal and flash their strength by wire to every point of need. Who can say?"

Not a day passed without new discoveries achieved or promised. That same New Year's Day, Dr. Simon Flexner of the Rockefeller Institute declared in a medical paper that human organ transplants would soon be common. Meanwhile, the very air seemed charged with the possibilities of the infant wireless technology. "When the expectations of wireless experts are realized everyone will have his own pocket telephone and may be called wherever he happens to be," *Hampton's Magazine* daringly predicted in 1908. "The citizen of the wireless age will walk abroad with a receiving apparatus compactly arranged in his hat and tuned to that one of myriad vibrations by which he has chosen to be called. . . . When that invention is perfected, we shall have a new series of daily miracles."

A FEW WEEKS before the year began, on the bright windless morning of December 16, 1907, thousands of spectators went to Hampton Roads, Virginia, to hail the departure of the Great White Fleet on its 43,000-mile voyage around the world. Roosevelt steamed in from the Chesapeake Bay aboard the presidential yacht, the *Mayflower*, to give a few last-minute instructions to fleet commanders and to add his considerable heft to the pomp and circumstance. As sailors in dress uniform stood at the rails and brass bands played on the vessels, the president watched. "Did you ever see such a fleet and such a day?" he shouted to his guests aboard the *Mayflower*. "Isn't it magnificent? Oughtn't we all to feel proud?" It was, he concluded, "perfectly bully."

For sheer majesty, the armada was impressive. "The greatest fleet of war vessels ever assembled under one flag," the *New York Times* reported. The 16 battleships were worth $100 million and comprised nearly 250,000 tons of armament. The *Mayflower* led the ships to the mouth of the Chesapeake Bay, and as the ships' bands played "The Girl I Left Behind Me," Roosevelt gave a last wave of his top hat.

Loaded to the gunwales and painted bright white, the ships steamed away, stretching out into a three-mile column. Not everyone understood exactly why Roosevelt sent those battleships around the world. Even now, it's difficult to give a simple answer. At the time, some Americans worried that the voyage was extravagant, rash and likely to provoke a war, most likely with Japan. Indeed, Roosevelt harbored real concerns that Japan, newly emboldened by a recent naval victory over Russia and angered by the mistreatment of Japanese immigrants in America, might pose a threat to the Philippines and other U.S. interests. "I had been doing my best to be polite to the Japanese and had finally become uncomfortably conscious of a very, very slight undertone of veiled truculence," he would write a few years later of his decision to send out the fleet. "[I]t was time for a showdown."

But Roosevelt also filled those 16 ships with friendly greetings and U.S. dollars. Among his instructions to commanders were firm words on preserving decorum among the ships' 13,000 sailors. Throughout 1908, as the battleships steamed port to port, from Rio de Janeiro to Sydney, they were greeted with adulation and American flags. When the fleet finally reached Japan in October of 1908, tens of thousands of schoolchildren greeted it by singing "The Star-Spangled Banner." Tensions between the two countries evaporated, and the voyage, once belittled by many as a dangerous stunt, was now applauded as a stunning success. Seldom has a president combined so deftly a message of power with offerings of peace.

LIBRARY OF CONGRESS

## North Pole Rivalry

**Adm. Robert Peary (above) set out for the North Pole on July 6, 1908, one of the hottest days of the year in New York City. As perspiring crowds thronged the shore, the *Roosevelt* backed into the East River, drawn by a tug. The following morning, Peary docked at Oyster Bay, Long Island, and lunched with his boat's namesake. "I believe in you, Peary," President Roosevelt said, "and I believe in your success—if it is within the possibility of man."**

**Since first visiting Greenland, in 1886, Peary had led six expeditions to the Arctic, including two failed attempts to reach the pole. He had sacrificed eight toes to frostbite and given much of his adult life to the pursuit. "The lure of the North!" he wrote. "It is a strange and powerful thing." He was confident he would make it to the pole this time. He could not be as confident that his former first mate and current nemesis, Dr. Frederick Cook, had not already gotten there.**

**In fact, Cook, upon reaching civilization after his 19-month journey, would claim that he'd discovered the North Pole on April 21, 1908.**

**Peary's feat would come a year later, on April 6, 1909. Almost immediately he accused Cook of not reaching the pole. Advocates of Cook, in turn, suggested that Peary had fabricated *his* discovery. Neither claim has been proved to a certainty, and the Cook-Peary flap remains one of the great unresolved controversies of the 20th century.**

To Americans, who were treated to endless stories about the 14-month voyage in newspapers and magazines, the Great White Fleet was a show of strength. The U.S. Navy was now on a par with Germany's navy and second only to Great Britain's. And America, with its capacity to produce more steel than Britain and Germany combined, could build ships faster than any country on earth.

THE SKY was full of miracles. In New York City, stupendous new buildings pointed upward to where the future seemed to beckon. The Singer Building, headquarters of the Singer Sewing Machine Company, was completed in the spring of 1908. At 612 feet, the "Singerhorn" (as wits soon began to call it, after the Matterhorn) was the highest inhabited building in the world. A few months later, the steel frame of the Metropolitan Life Building leapt over the Singer to 700 feet.

Illustrators imagined a future city of golden towers connected by slender suspension bridges and great masonry arches. Moses King, in a 1908 illustration, imagined dirigibles and other flying craft floating over vaulting towers and bridges in New York City, bound for destinations such as the Panama Canal and the North Pole. A caption referred to "possibilities of aerial and interterrestrial construction, when the wonders of 1908 . . . will be far outdone."

No aerial wonder topped the Wright brothers' feats that year. Absent from Kitty Hawk, North Carolina, since their first brief flights there in 1903—and not having flown a lick since 1905—they returned to nearby Kill Devil Hills in April to dig out their old shed and dust off their piloting skills. The Wrights' ability to fly had advanced beyond their first thrilling seconds in the air—but their competitors had also advanced, and the Wrights felt the pressure. A coterie of bright and ambitious young men had joined Alexander Graham Bell, inventor of the telephone, to form the Aerial Experiment Association (AEA). On March 12, 1908, in Hammondsport, New York, Casey Baldwin, an AEA member, had flown above an icy lake for a distance of almost 320 feet. Four months later, on the Fourth of July, Glenn Hammond Curtiss flew an AEA craft nearly a mile over Hammondsport.

For the previous three years, as the Wrights had dallied with possible buyers of their aircraft, critics and competitors increasingly construed their reticence to fly as evidence of failure or, worse, of fraud. Now, in the spring of 1908, they had two offers of purchase—from the U.S. Army and a private French syndicate. Both offers depended on public demonstrations of the aircraft. After a few weeks of practice in Kitty Hawk, Wilbur sailed to France to demonstrate the Wright Flyer. Orville undertook his own flight trial at Fort Myer, near Washington, D.C. The time had come to put up or shut up.

It was 6:30 on the evening of August 8 when Wilbur climbed into the seat of his Wright Flyer at a horse track near Le Mans. He wore his usual gray suit, starched white collar and green cap, turned backward so it would not blow off in flight. The evening was calm, and so, outwardly, was he. This would be the first public demonstration of a Wright plane. Much, possibly everything, was riding on it. The last time he had flown—a private practice flight at Kitty Hawk in May—he had crashed and destroyed the plane. If he did so now, the French trials would be over before they had begun, and the name *Veelbur Reet*, as they pronounced it in Le Mans, would be the punchline of a French joke.

Spectators watched from the grandstand as the twin propellers behind Wilbur started to spin. All at once, the plane shot forward on its track. Four seconds later, it was airborne, rising quickly to 30 feet, higher than most of the French aviators had flown but low enough to give the audience a view of Wilbur as he made a slight adjustment to the control levers. The plane instantly responded, one wing dipping, the other lifting, and banked to the left in a tight, smooth half circle. Coming out of the turn, the plane made a

## Lust and Murder

**On the morning of January 6, 1908, Harry Thaw (left), profligate son of a rich Pittsburgh industrialist, walked into Manhattan's Criminal Courts building to be retried for the murder of celebrated architect Stanford White (right). Eighteen months earlier, Harry and his pretty young wife, Evelyn (center), had entered the rooftop cabaret of Madison Square Garden where White was in the audience. Thaw shot him three times.**

**The case riveted the nation. Notable among the revelations was White's predilection for stag parties and adolescent ingénues, including, in 1901, the sweet-faced chorus girl Evelyn Nesbit, then 16. Thaw had meant to avenge that crime.**

**Thaw's first trial, in 1907, had ended in a hung jury. Now the public would again hear lovely Evelyn, with her soft cheeks and plush waves of hair, tell her degrading tale. The district attorney insinuated that she was far less innocent than she appeared.**

**The trial underscored the hypocrisy of a Victorian morality that made a fetish of female innocence and enabled wealthy men such as White and Thaw to act as if it was their prerogative to exploit the poor.**

**In the end, on January 31, the jury went along with Harry Thaw's insanity defense, and the judge remanded him to the Matteawan Asylum in New York. But not before the public reveled in weeks of sexual divulgence and schadenfreude, ravenous for stories about the squalors of the rich, the beautiful and the damned.**

BETTMANN / CORBIS (2); (INSET) RUDOLPH EICKEMEYER, JR. / NATIONAL MUSEUM OF AMERICAN HISTORY, SI

**While the Singer Building in New York City augured a skyscraper future, the Wright brothers cleared the way for powered flight—but not before Orville crashed at Fort Myer September 17, killing passenger Thomas Selfridge (right: the two before takeoff).**

NEW YORK PUBLIC LIBRARY; C.H. CLAUDY / NEW YORK HERALD

and thereby setting a new record in the air.

Now, it was Orville's turn. On September 9, he took off from Fort Myer, Virginia. He'd already made a few brief desultory hops, but now he flew for family honor and national pride. The plane shot up and began soaring around the parade ground. After 11 minutes, it was clear Orville intended to beat Delagrange's record. The spectators watched him circle the field, taking about a minute per circuit, the engine of the plane crescendoing, fading, then crescendoing again. He had flown about 30 circuits when somebody called out, "By Jings, he's broken Delagrange's record!" According to the *New York Herald* reporter C. H. Claudy, everybody grabbed one another's hands, each man aware, according to Claudy, that he "had actually been present while aerial history was being reeled hot from the spinning wheel which made that awkward, delicate, sturdy and perfect wonder above their heads go round and round the field."

straight run down the length of the track, about 875 yards, then banked and turned into another half circle. Wilbur Wright looped the field once more, then brought the plane down almost exactly where he had taken off less than two minutes earlier.

The flight had been brief, but those 100 or so seconds were arguably the most important Wilbur had spent in the air since 1903. Spectators ran across the field to shake his hand, including the same French aviators who had only recently dismissed him as a charlatan. Léon Delagrange was beside himself. "Magnificent! Magnificent!" he cried out. "We're beaten! We don't exist!" Overnight, Wilbur was transformed from *le bluffeur*, as the French press had tagged him, to the "Bird Man," the most celebrated American in France since Benjamin Franklin. "You never saw anything like the complete reversal of position that took place," he wrote to Orville. "The French have simply become wild."

Yet a few weeks later, Delagrange momentarily overshadowed Wilbur's achievement by flying for 31 minutes

Orville had no idea he'd broken Delagrange's record. He was lost in flying. He canted into sharp corners and dipped low, skimming over the parade ground, then suddenly rose to 150 feet, higher than anything visible but the needle of the Washington Monument and the dome of the U.S. Capitol rising to the east, backlit by morning sun. "I wanted several times today to fly right across the fields and over the river to Washington," Orville later confessed, "but my better judgment held me back." After 58 circuits of the parade ground, he landed. He had flown 57 minutes and 31 seconds, nearly double Delagrange's record.

The Wrights held the attention of the world, and over the next week or so, as Wilbur flew above adoring crowds in France, Orville set ever longer endurance records at Fort Myer. On September 10, he flew more than 65 minutes; on

the 11th, more than 70; on the 12th, almost 75. That same day he set a new endurance record with a passenger—9 minutes—and an altitude record, 250 feet.

Then, tragedy: on September 17, while flying over Fort Myer with an Army lieutenant named Thomas Selfridge, Orville crashed. He was badly injured. Selfridge was killed.

It appeared as if the crash might end the Wrights' career and set American aeronautics back years. Wilbur ceased flying in France, as Orville lay recuperating in the hospital, attended by his sister. But on September 21, Wilbur lifted off from Le Mans and began circling the artillery ground at Camp d'Auvours above his largest crowd ever, 10,000 spectators. When Wilbur surpassed Orville's flight of nearly 75 minutes, "a yell went up which defies description," according to the *Herald*. Still, he flew. The drone of the motor came and went, and the sky grew darker and the air cooler. At last, the plane descended and settled on the ground. Wilbur had flown for 91 minutes and 31 seconds, covering 61 miles—a new record. He had banished any conjecture that the Wrights were finished. "I thought of Orville all the time," he told reporters.

Wilbur saved his greatest triumph for the last day of the year. On December 31, 1908, he flew 2 hours and 20 minutes over Le Mans, winning the Coupe de Michelin and affirming the Wrights' place in history. "In tracing the development of aeronautics, the historian of the future will point to the year 1908 as that in which the problem of mechanical flight was first mastered," *Scientific American* stated, "and it must always be a matter of patriotic pride to know that it was two typical American inventors who gave to the world its first practical flying machine."

IN OCTOBER, during the climax of one of the most thrilling seasons in baseball history (the Chicago Cubs would snatch the National League pennant from the New York Giants, then defeat the Detroit Tigers in the World Series—which they haven't won since.), Henry Ford introduced his oddly shaped new automobile, the Model T. At 45, Henry Ford had been in the automobile business a dozen years, since building his first horseless carriage in a brick shed behind his Detroit home in 1896. Still, everything he had done was a warm-up to what he hoped to accomplish—"a motor car for the great multitude," he said.

Since most automobiles of the day cost between $2,000 and $4,000, only the well-off could afford them, and the machines were still largely for sport. An advertisement of the time, printed in *Harper's Weekly*, shows an automobile soaring over a hill as a gleeful ménage frolics inside. One passenger reaches into a basket. "There is no more exhila-

**Not long after production of the Model T began in the fall of 1908, it would fulfill the dream of Henry Ford (with a Model T in Buffalo, New York, in 1921) to empower the masses.**

AP IMAGES

rating sport or recreation than automobiling," the ad says. "The pleasure of a spin over country roads or through city parks is greatly enhanced if the basket is well stocked with Dewar's Scotch 'White Label.' "

The fact that automobiles brought out the worst excesses of the rich, confirming what many Americans already believed about them—they were callous, selfish and ridiculous—added to the resentment of those who could not afford the machines. "Nothing has spread socialistic feeling in this country more than the use of the automobile, a picture of the arrogance of wealth," Princeton University president Woodrow Wilson had said in 1906. Yet by the time he became president of the United States six years later, even socialists would be driving Model T's.

The automobile that rolled out of Ford's Piquette Avenue plant that fall did not look like a machine of destiny. It was boxy and top-heavy. The automobile writer Floyd Clymer would later call it "unquestionably ugly, funereally drab." The hard-sprung, church-pew seats made no concession to elegance or comfort. Rather, every aspect of the car was considered with an eye to lightness, economy, strength and simplicity. The simpler a piece of machinery, Ford understood, the lower the cost, and the easier it would be to maintain. Equipped with a manual and a few basic tools, a Model T owner could carry out most repairs himself. The new car's transmission would be smoother and longer lasting than any that had ever been designed. The small magnetized generator that provided a steady flash of voltage to ignite the automobile's fuel would be more dependable. The Model T was designed to ride high off the ground to give it plenty of clearance over America's infamously bumpy roadways, while the car's suspension system allowed it to handle the roads without tossing out occupants. Ford had also foreseen a day when the ditch at the side of the road would be less of a concern to motorists than oncoming traffic: he had moved the steering wheel to the left side, to improve the driver's perspective of approaching vehicles.

BETTMANN / CORBIS

## Stunt Men

**As tens of thousands of spectators crowded into Times Square on February 12, 1908, six automobiles from four countries set out on a 20,000-mile race from New York City to Paris.**

**Yes, New York City to Paris.**

**As conceived by the *New York Times* and its Parisian cosponsor, *Le Matin*, the race called for the automobiles to drive west across the United States, north into Alaska, across the Seward Peninsula and the ice of the Bering Strait, then through Russia and Europe, landing in Paris—"the longest and most perilous trip ever undertaken by man," the *Times* called it. One contestant described it, perhaps more accurately, as "a journey for madmen."**

**The American-made Thomas Flyer took nearly two weeks to reach Chicago, a journey the Twentieth Century Limited train made daily in 18 hours. Later, Alaska's dog sled trails proved impassable. As for the Bering Strait, the racers had about as much chance of driving across it as they did of flying to the moon. (They would cross the Northern Pacific in ships.)**

**But the organizers improvised, the racers—some, anyway—carried on, and the event turned out to be nearly as exciting as promised. On July 30, the Thomas Flyer rattled into Paris and was declared the winner. President Roosevelt said in congratulation that he "admired Americans who did things, whether it was up in an airship, down in a submarine, or in an automobile."**

Ford Motor Company launched a national advertising campaign, with ads appearing in the *Saturday Evening Post*, *Harper's Weekly* and other magazines. For an "unheard of" price of $850, the ads promised "a 4-cylinder, 20 h.p., five passenger family car—powerful, speedy and enduring." An extra $100 would buy such amenities as a windshield, speedometer and headlights.

Ford manufactured just 309 Model T's in 1908. But his new automobile was destined to be one of the most successful ever made. In 1913, Ford would institute the assembly line at his Highland Park, Michigan, plant. In its first year, the company more than doubled its output of Model T's, to 189,000, or about half the automobiles manufactured in America that year. By 1916, Ford would be making almost 600,000 cars a year and could lower the price of the Model T to $360, which produced more demand, to which Ford responded with more supply.

Henry Ford was superb at anticipating the future, but not even he could have predicted the popularity of the Model T and the effects it would have for years to come on how Americans lived and worked, on the landscape surrounding them and the air they breathed—on nearly every aspect of American life. The United States would become, in large part thanks to the Model T, an automobile nation.

IT WOULD be wrong to leave the impression that life was a frolic for most Americans. Vast numbers lived in poverty or near poverty. The working class, including some two million children who joined adults in steel mills and coal mines, labored long hours at occupations that were grueling and often dangerous. Tens of thousands of Americans died on the job in 1908.

In the fall of that year, the term "melting pot" entered the American lexicon, coined by playwright Israel Zangwill to denote the nation's capacity to absorb and assimilate different ethnicities and cultures. To our ears, the words may sound warm and delicious, like a pot of stew, but to Zangwill the melting pot was a

caldron, "roaring and bubbling," as he wrote, "stirring and seething." And so it was. Violence erupted frequently. Anarchists ignited bombs. Gangs of loosely organized extortionists known as the Black Hand dynamited tenements in New York's Little Italy. Armies of disgruntled tobacco farmers, called Night Riders, galloped through Kentucky and Tennessee, spreading terror. Violence against African-Americans persisted, with dozens of lynchings in 1908. That August, whites in Springfield, Illinois—ironically, the hometown and resting place of Abraham Lincoln—tried to drive black citizens from the city, burning black businesses and homes and lynching two black men. (Like many events of 1908, even Springfield had a far-ranging impact: the riot led to the founding of the NAACP the next year.)

On the other side of the world, there was a breakthrough of sorts: on December 26, 1908, in Sydney, Australia, a 30-year-old African-American boxer from Galveston, Texas, named Jack Johnson stepped into the ring to fight Tommy Burns, the heavyweight champion of the world. Like every titleholder before him, Burns had refused to compete against a black man. But Johnson pursued Burns, badgering him until even whites began to suspect the Canadian was hiding beneath his white skin. Burns finally agreed to a match, but only with a deal that guaranteed him $30,000 of a $35,000 purse.

Johnson destroyed Burns before 25,000 spectators. Blood was pouring from Burns when police stopped the fight in the 14th round. The referee declared Johnson the victor. "Though he beat me, and beat me badly, I still believe I am his master," said Burns after the fight, already calling for a rematch.

Johnson laughed. "Now that the shoe is on the other foot, I just want to hear that white man come around whining for another chance." Eventually, Burns decided he did not want another chance after all.

Johnson would remain the heavyweight champion for seven years, fending off a series of "Great White Hopes." He would be sent to jail in 1920 after federal prosecutors, misapplying a statute meant to discourage prostitution, charged him with illegally transporting a woman across state lines for immoral purposes after he'd sent a train ticket to one of his white girlfriends. That was later, though. Now was Christmas, and Jack Johnson's victory was a gift for African-Americans to savor in the closing moments of 1908.

For all the problems, perhaps the most impressive trait Americans shared in 1908 was hope. They fiercely believed, not always with good reason, that the future would be better than the present. This faith was represented in the aspirations of the hardworking immigrants, in the dreams of architects and inventors and in the assurances of the rich. "Any man who is a bear on the future of this country," J. P. Morgan famously declared in December of 1908, "will go broke."

It's striking, in fact, how much more hopeful Americans were then than we are today. We live in a nation that is safer, healthier, richer, easier and more egalitarian than it was in 1908, but a recent Pew Research Center poll found that barely one-third of us feel optimistic about the future.

Of course, we are wiser now to the downsides of the technologies that were only just emerging in 1908. We cannot look at an airplane without knowing the death and destruction, from World War I to 9/11, that airplanes have wrought. Automobiles may have once promised exhilarating freedoms, but they also deliver thousands of deaths every year and horrendous traffic jams, and they addict us to foreign oil (1908 was the year, coincidentally, that oil was discovered in Iran) and pollute the atmosphere with, among other things, carbon dioxide, which will alter the earth in ways few of us dare imagine. The American military pride that sailed with the Great White Fleet on its voyage around the world in 1908 and was met with adoration at every port, is now tempered by the knowledge that much of the world despises us. We are left with the disquieting thought that the next 100 years may bear a price for the conveniences and conquests of the last 100.

GRANGER COLLECTION, NEW YORK

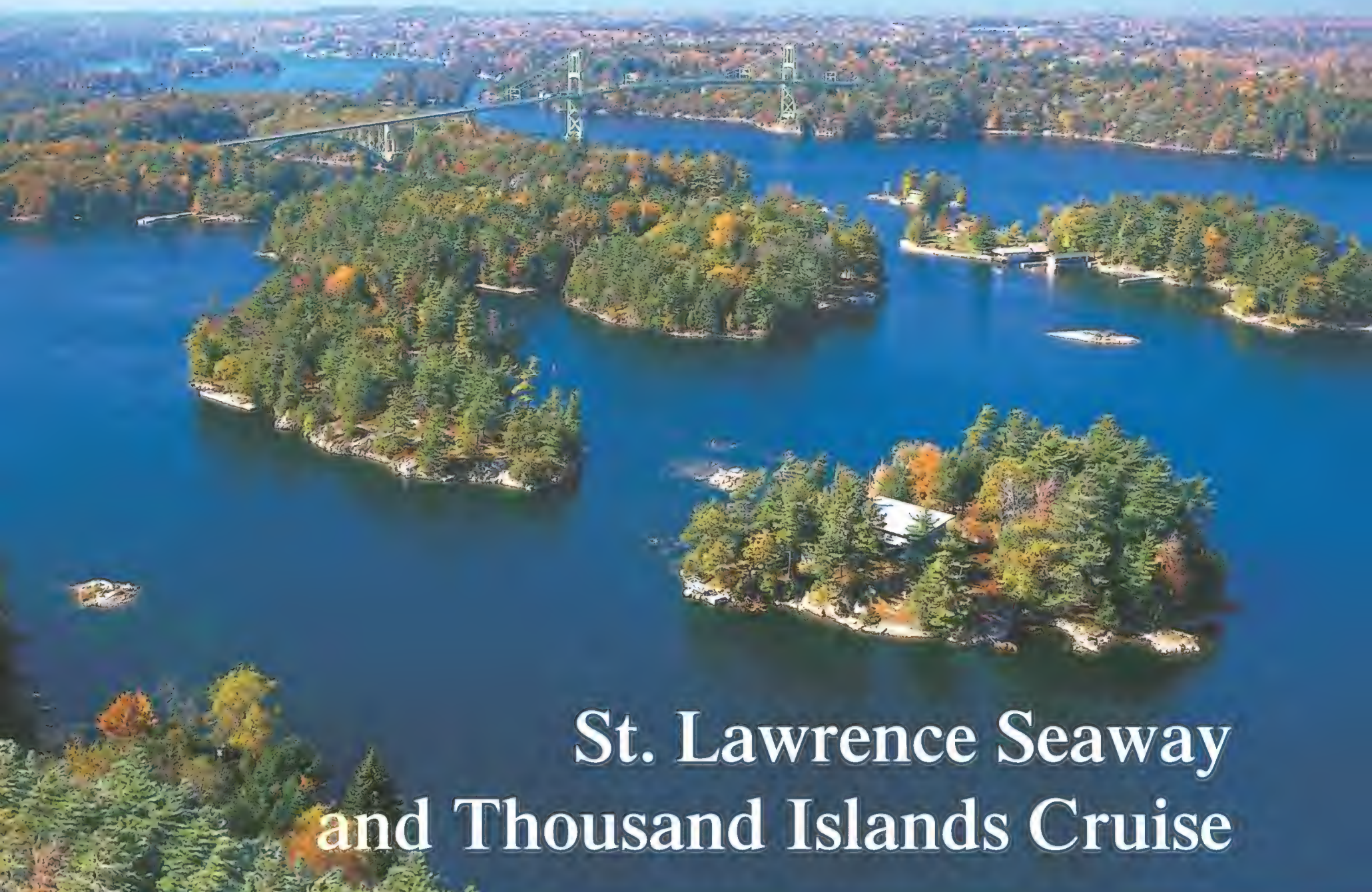
## Bully for Green

**In May 1908, forty-one of America's 46 governors gathered in the White House along with all nine justices of the Supreme Court, most of the president's cabinet, congressmen, industrialists, labor leaders and scientists—altogether more than 350 men (and one woman: Sarah S. Platt-Decker, president of the General Federation of Women's Clubs).**

**"We have become great because of the lavish use of our resources and we have just reason to be proud of our growth," Teddy Roosevelt (above) told the first-ever Governors Conference on the Conservation of Natural Resources. "But the time has come to inquire seriously what will happen when our forests are gone, when the coal, iron, the oil, and the gas exhausted."**

**His concern was not that the earth was being fouled by pollution; it was that the earth was being stripped and depleted. Coal reserves and minerals, forests and fresh water, would be used up if America did not take care. "We must handle the water, the wood, the grasses," he warned, "so that we will hand them on to our children and our children's children in better and not worse shape than we got them."**

**If the rationale of an early-20th-century conservationist differed from that of an early-21st-century environmentalist, the imperative was much the same: to use less. And to Roosevelt's everlasting credit, he was using the full force of his office to address not the politically urgent present but a future he would not live to see.**



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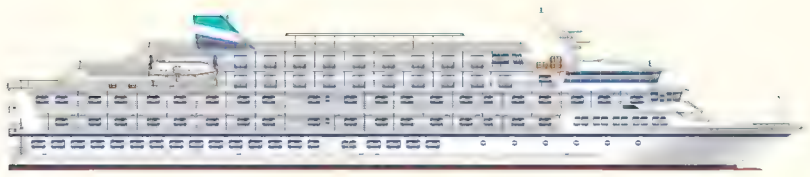

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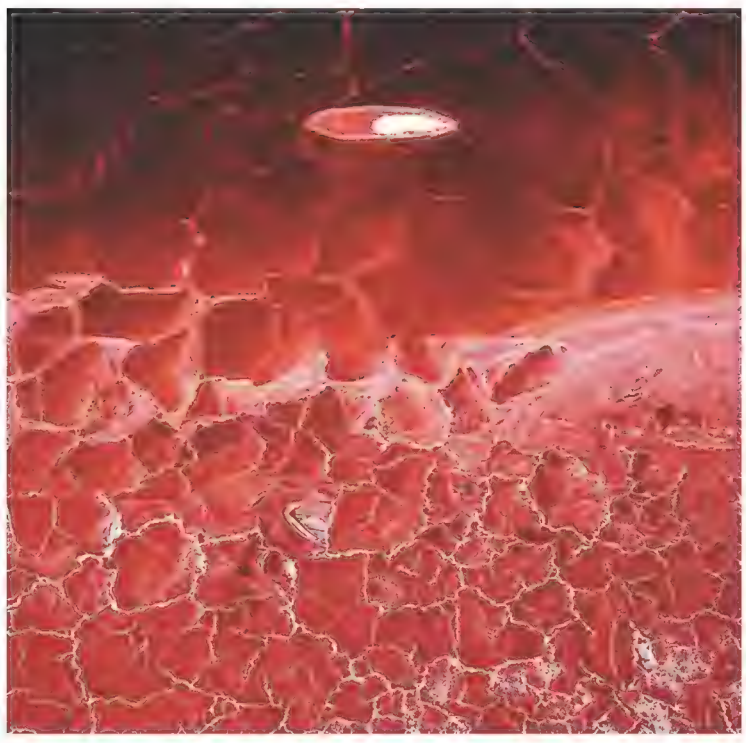
# DANGER ZONES

## Warning: David Maisel's aerial landscapes may be hazardous to your assumptions

**BY MEGAN GAMBINO**

DAVID MAISEL DOESN'T CONSIDER HIMSELF AN ENVIRONMENTAL ACTIVIST. Yet his large-scale aerial photographs of strip mines, a bone-dry lake bed and man-made evaporation ponds can be viewed as indictments of our indifference to the planet that sustains us. Once you figure them out, that is. The photographs call to mind everything from blood vessels to stained-glass windows. "They might be mirrors into who we are as a society and who we are in our psyches," Maisel says.

At a recent exhibit (traveling through 2010) of Maisel's "Black Maps"—aptly titled because they leave most viewers in the dark as to where they are—his *Terminal Mirage 1* (p. 56) looked to me like a neat grid of farmland seen from an airplane window. Except that instead of familiar tans and greens, there are eye-popping blues and whites. Maisel's *Terminal Mirage 10* could be a loopy combine operator's excursion through a wheat field.

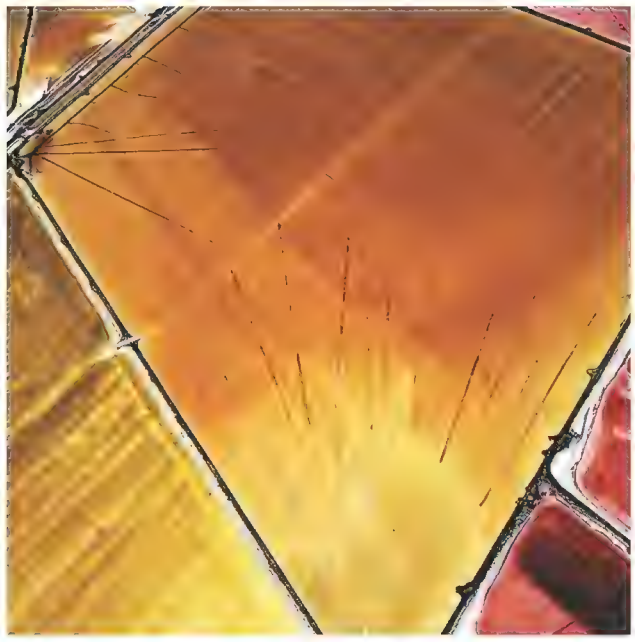


**Maisel likens the red water of California's Owens Valley (above: *Lake Project 3,* 2001) to human blood. "In a way," he says, the photograph "is an autopsy of this place." In *Terminal Mirage 10* (right), which the photographer took near Utah's Great Salt Lake in 2003, tire tracks through a salt-marsh evaporation pond suggest an Abstract Expressionist painting.**

Though Maisel chooses not to provide explanatory labels for his photographs, wanting viewers to come to their own conclusions, in an interview he identified *Terminal Mirage 1* as evaporation ponds bordered by berms, and *Terminal Mirage 10* as tire tracks through the crusted surface of an evaporation pond. Both are from near Utah's Great Salt Lake.

Maisel also wants to challenge our notions of beauty. He thus describes the usual reaction to his work as "this experience where people are seduced by the seeming surface beauty of an image, and then as they learn more about what it is they may be looking at, they realize that there is, in a way, a betrayal." Bright colors become ugly

Earthworks artist Robert Smithson's creation *Spiral Jetty* (1970) in the Great Salt Lake resurfaced in 1999, when drought lowered the water level. "I've been interested in Smithson's works for decades," says Maisel, who photographed the coil in 2003.



Maisel is "an artist who uses color and form to engage viewers in subjects they might otherwise overlook," says Museum of Fine Arts, Houston, photography curator Anne Wilkes Tucker. Clockwise from far left: Southern shores of the Great Salt Lake, 2003; copper mine in Globe, Arizona, 1988; and periphery of the Great Salt Lake, 2003, in *Terminal Mirage 1*.

DAVID MAISEL / VON LINTEL GALLERY (3); P. 52, PP. 52-53 DAVID MAISEL / VON LINTEL GALLERY (2); PP. 54-55 PHOTO: DAVID MAISEL / VON LINTEL GALLERY. SPIRAL JETTY ART © ESTATE OF ROBERT SMITHSON / LICENSED BY VAGA, NY

stains, painterly strokes morph into indelible gouges and marbled veneers turn out to be leached toxins. "We sense that this violent range of continuous colors is extraordinary and possibly dangerous," writes Anne Wilkes Tucker, curator of photography at the Museum of Fine Arts, Houston, where five of Maisel's works are part of the permanent collection. "Nevertheless, we are drawn in by their formal beauty."

His latest projects venture into urban landscapes and non-aerials but have the same hauntingly beautiful aesthetic. *Oblivion* (2004-6), a series of Maisel aerials of Los Angeles, reflects on the consequences of diverting water to that city from Owens Valley in southeastern California. *Library of Dust* captures corroding copper canisters that hold the unclaimed, cremated remains of patients who died from the 1880s to the 1970s in a state-run psychiatric hospital in Salem, Oregon.

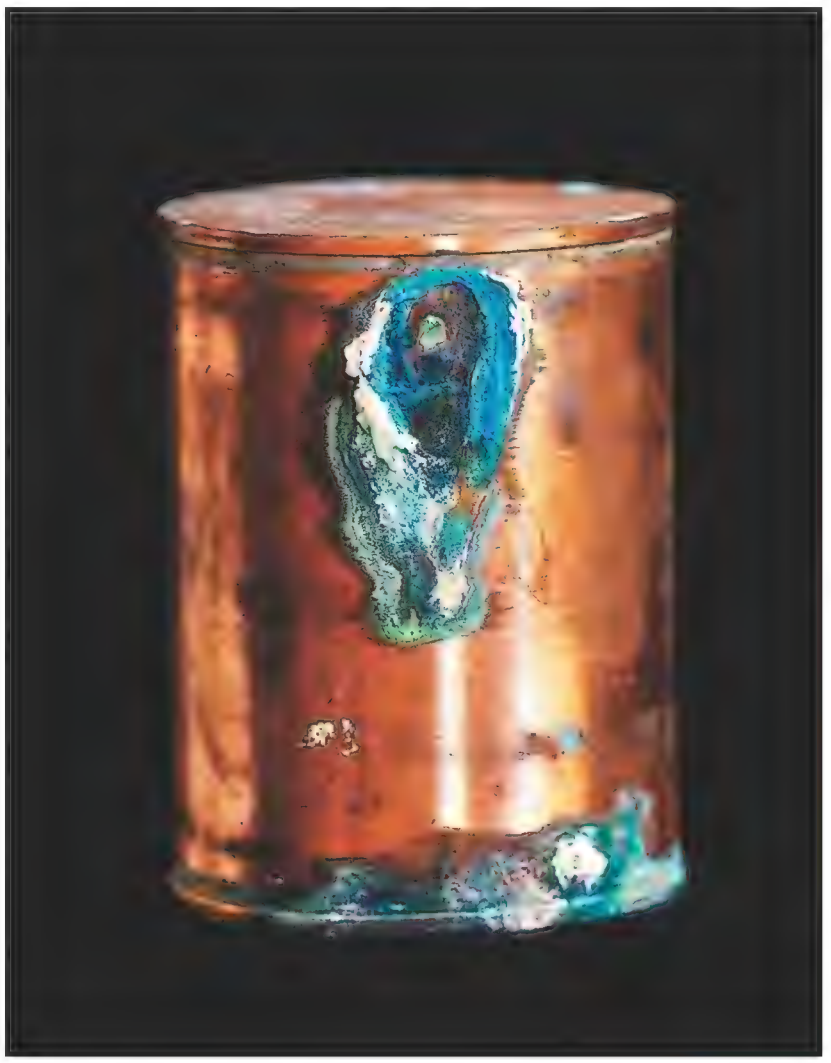
Growing up on Long Island in the 1960s and '70s, Maisel, 46, lived on a suburban block where most of the houses had identical floor plans. To many postwar Americans, these inexpensive, cookie-cutter dwellings represented the American dream. But to the youngster, the conformity seemed strange, even disorienting. "It's all so disparate, confused and without a center," he says. "When you're a little kid, you think, 'How can someone live in the same house as I do? How could that be?' " He took note of the subtle shifts in paint color, the shapes of trim and the widths of driveways, trying to make sense of it all. At Princeton, where he studied art history and visual arts, he accompanied one of his professors to Mount St. Helens, which had erupted shortly before, taking photographs of the volcano and surrounding terrain. "It was an introduction to a way of seeing," says Maisel. "I witnessed how the logging industry was changing the landscape and came away with a few aerial photos. The two came together and suggested ways to continue." He did so by photographing sand quarries along the Delaware River as well as mines in Pennsylvania and out West.

When he was in his 20s, working as an assistant to an architectural photographer, the Metropolitan Museum of Art acquired three of his pieces. In 1993, to be closer to the topography he was most passionate about, he moved from New York City to San Francisco. From there he scoured the Western states, looking for bizarre patterns. He says locations tend to choose him, as when he first spotted the glittering pink bed of Owens Lake through a car window.

Maisel often hires a local pilot to take him up in a four-seater Cessna he likens to an old Volkswagen beetle with wings. Then, somewhere between 500 and 11,000 feet, the pilot banks the plane and the photographer props open a window and starts shooting with his hand-held, medium-format camera. "Although the subjects are always of concern to me, I do think that I want to lead the viewer into a space where they can do their own thinking," he says.

**MEGAN GAMBINO** *is an editorial assistant at* SMITHSONIAN.

To see more of David Maisel's images, visit Smithsonian.com/maisel



**For his 2004-6 series *Oblivion*, which addresses Los Angeles' phenomenal growth, Maisel wanted to create an X-ray effect. In 2004's *Oblivion 3n* (top), a section of the city calls to mind electric circuitry or perhaps the photographer's memories of Long Island. Maisel's latest project (above: 2005's *Library of Dust 269*) focuses on copper canisters, some 120 years old, that contain human remains. "It's a completely different way of working photographically," he says, "and yet it is tapping into the same vein of trauma and visuality."**

DAVID MAISEL / VON LINTEL GALLERY (2)

# THINKING LIKE A MONKEY

## What do our primate cousins know and when do they know it? Researcher Laurie Santos is trying to read their minds

**BY JERRY ADLER**

**PHOTOGRAPHS BY SYLWIA KAPUSCINSKI**

ON A HOT MORNING in early August, the primate census of Cayo Santiago, a 38-acre island just off the coast of Puerto Rico, numbers approximately 875. Of those, 861 are resident *Macaca mulatta*, commonly known as rhesus macaques, the descendants of a colony transported here from Calcutta in 1938 to provide a permanent breeding stock for medical researchers. The rest are *Homo sapiens* who have made the trip in a motorboat, including workers stocking the feeding bins with dun-colored biscuits of monkey chow, and researchers for whom the island provides a rare opportunity to study free-ranging primates without the drudgery of having to locate them deep in some remote forest.

The researchers comprise two distinct disciplines, with widely divergent interests and approaches. Ever since E. O. Wilson visited here in 1956 and came away with the ideas that would eventually become the foundation of a whole new field of research he called sociobiology, the island has been a mecca for ethologists, who study the monkeys' social hierarchies and interactions. It has also been discovered by experimental psychologists, who study the animals' thinking processes. Since the former try to stay as unobtrusive as possible, while the latter employ attention-getting constructions of colored posterboard and bags of fruit, there's a certain unavoidable tension between the disciplines. Trailed by three undergraduates toting armloads of gear up a path sodden with monkey droppings, Laurie Santos, a psychologist at Yale, is in the latter camp. "This is what we do," she says, "hike around looking for monkeys by themselves who are hungry and want to play. It's hard to find social creatures by themselves," she adds as she backs out of the field of view of a primatologist's video camera, "and even harder to find ones that aren't being followed by other researchers."

Santos has been coming to Cayo every year since 1993, when she was a freshman at Harvard and volunteered to work here with her psychology professor, Marc Hauser. She keeps that tradition alive with her own undergraduates. With her bright smile and mass of curly dark hair, Santos, 32, could pass for an undergraduate herself. Her boyfriend, Mark Maxwell, actually is an undergrad—albeit one who dropped out of MIT and supported himself for years by playing poker before returning this year to finish his degree at Yale. Santos teaches a class, "Sex, Evolution and Human Nature" with a course description ("Topics include . . . human mating strategies, the biology of warfare, sex differences in behavior, love and lust . . . ") that all but guaranteed it would have to be held in the largest classroom on campus, the law school auditorium. She was embarrassed last year when her mother attended one of her lectures and by happenstance chose the day that she was discussing the female orgasm. "I had to cover it, but my mom was in the auditorium, so I kind of rushed through it," Santos says. "I hope the students didn't notice."

She has built a growing and impressive list of publications in cognitive neuroscience (mostly having to do with how primates understand physical objects and relations) and evolutionary psychology, the field that grew out of sociobiology. "If you see something in a primate," Santos reasons, "you can use it as a window into the evolutionary past of human beings."

On this summer day, if her undergraduate volunteers expected to be investigating the exuberant and promiscuous sex life of the rhesus macaque, they must be disappointed. Santos' interest here is in what psychologists call "theory of mind," the ability to impute thoughts and intentions to another individual, one of the cornerstones of human cognition. "Sitting here talking with you," Santos explains, "all I can see is your behavior, but I draw inferences about your desires and thoughts. The interesting question is, how far back in evolutionary time does that ability extend? Can it exist without language?" As recently as a decade ago, the conventional wisdom doubted that even chimpanzees, which are more closely related to human beings than are monkeys, possessed theory of mind. This view is changing, in large measure because of

P. 59 SYLWIA KAPUSCINSKI / WPN

To learn how the mind works, biologist Laurie Santos (with a research subject on Cayo Santiago) studies a seemingly paradoxical question: Do monkeys assume that people act like monkeys?

the work of Santos and her collaborators. With her students in tow and a small bag of grapes in her pocket, Santos is now out to demonstrate the phenomenon—if a *Macaca mulatta* can be induced to cooperate.

**TRIAL 1:** The experiment relies on one of the most predictable traits of rhesus monkeys: their tendency to steal food at every opportunity. Santos discovered this a few years ago when she and her colleagues were running experiments in cognition and tool use involving lemons, and frequently had to quit early because the animals stole all the fruit. The island's monkeys are supplied with food, of course, and they also forage, but to leave so much as a raisin unguarded is to invite larceny; the researchers eat their own lunches inside a locked cage of cyclone fencing.

The theory-of-mind experiment is designed to test whether the monkeys, who obsessively guard their own food, assume that people do the same. If so, Santos reasons, they should prefer to steal from people who are looking away. So Santos enlists Olivia Scheck and Katharine Jan, Yale student volunteers here for the month. They are dressed alike in blue slacks and white shirts to minimize any confounding effect from their appearance—although there are differences Santos cannot do anything about, because Olivia is several inches shorter than Katharine, and blond, where Katharine is dark-haired. In general, Santos has found, rhesus macaques prefer to steal from the shorter person, although top-ranking dominant males sometimes do the opposite, apparently just to show off.

The goal is to locate a monkey that isn't busy doing something else and isn't distracted by other monkeys. That's not always easy on this crowded island; monkeys who seem to be off by themselves are often low-ranking males skulking around a female in hopes of getting a quick copulation—out of sight of the dominant males. Once Santos has a monkey's attention, she holds up two grapes for it to see and impales each on a stick placed a few feet apart on the ground. Each student stands behind one of the grapes. Then Katharine turns her back on the monkey, while Olivia stares straight ahead. If the monkey doesn't fall asleep, wander off or lose interest, it will scamper, saunter or nervously edge over to one grape or the other and snatch it up. Based on published results, says Santos, nine times out of ten the person whose back is turned is the one who gets robbed.

**Reserved for scientists (Santos, at right, with student Olivia Scheck), Cayo Santiago is home to more than 850 monkeys, descendants of a colony started in 1938. A bite is no day at the beach: the animals can carry a virus that can be fatal to people.**

This time, the monkey, who apparently hadn't read the literature, heads straight for Olivia's grape, grabs it from right under her nose and runs off.

SANTOS HAS TRAVELED a long and (to her) unexpected path to this patch of tropical forest. She grew up in New Bedford, Massachusetts, the daughter of a high-school guidance counselor mother and a computer programmer father. She's French-Canadian on her mother's side, and on her father's is descended from Cape Verdean fishermen who settled in New England generations ago. In high school, all she knew about college was that she wanted to attend one in Boston; she chose Harvard because, taking financial aid into account, it was the least expensive. She enrolled in Hauser's psychology class, on which her own is modeled, because she was closed out of a course she'd needed for her intended career as a lawyer, and was won over by the charismatic professor and the intellectual challenge of a rapidly evolving field.

Santos did not originate the idea that has fueled several breakthroughs in the past decade, but she has been one of the most imaginative and successful in applying it. The concept, known as "domain specificity," holds that the cognitive abilities of primates evolved for particular tasks and can be tested only in a context that is meaningful to the animal itself. The early theory-of-mind experiments tried to enlist monkeys or chimps in begging for food, sharing it or cooperating to find it—behaviors, says Santos, that do not come naturally to them. As she and co-author and Yale colleague Derek E. Lyons put it in a recent paper in the journal *Philosophy Compass*, "though primates are social creatures, they are not exactly sociable ones." Colleagues say Santos has a talent for

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**JERRY ADLER** *is a* Newsweek *senior editor specializing in science and medicine.* **SYLWIA KAPUSCINSKI** *usually photographs human primates, and focuses on immigrants.*

MAP: MIKE REAGAN; SYLWIA KAPUSCINSKI / WPN

thinking like a monkey. Her experiments cleverly elicit and exploit primates' natural gifts for competitiveness, stealthiness, hoarding and deceit.

**TRIAL 2:** This time Olivia is the one facing away, and the monkey, better versed in theory-of-mind, makes a dash for her grape.

RHESUS MACAQUES, ESPECIALLY JUVENILES, are capable of simulating cuteness, but it's not their defining characteristic. Scrappy and long-limbed, with pink hairless faces framed by gray or brown fur, they fight convincingly among themselves. At least two here appear to have lost limbs in their perpetual struggle for rank, and they will stand up to a human being if the stakes are high enough—a grape, for example. They have been known to carry a variety of herpes that can be fatal to human beings, and scattered around the island are first-aid stations holding disinfectant kits to be used in case of a bite. (On the other hand, a single human visitor with active tuberculosis could wipe out the entire colony.) Santos recognizes many of the individual monkeys here by sight or by the letter-and-number code tattooed on their chests, but she says she has never been even tempted to name them.

**Vocal and intelligent, rhesus monkeys live in groups that cooperatively care for youngsters (grooming on Cayo Santiago). "It's hard to find social creatures by themselves," Santos says of her island research forays.**

She has somewhat more affection for the 11 capuchin monkeys in her lab at Yale, who are named after characters in James Bond movies (Goldfinger, Jaws, Holly Goodhead). Her work with them involves experiments on "social decision-making." She equips them with tokens they can trade for food and studies the development of their rudimentary economy. Like human beings, they are loss-averse: if the going price is two grapes for a token, they prefer to trade with an experimenter who shows them one grape and then adds one, compared with one who shows three and takes one away. They are also sneaky. After swapping for an apple, she says, they will sometimes take a bite of it, then present the untouched side to the researcher and try to sell it back. And they have an entrepreneurial bent. At times they would offer their feces in exchange for a token, behavior that baffled the researchers until a student pointed out that every morning someone comes into the cage and scoops out the droppings—which may have given them the idea that people value them.

**TRIAL 3:** Katharine faces away again, and the monkey sidles up and grabs her grape, just as science would predict. Then it does a quick sideways dash and snatches up Olivia's as well.

THE EXPERIMENTS done so far are tests of first-order knowledge: the monkey sees the human experimenter either facing or facing away from the grape. Now Santos intends to test whether macaques possess the more sophisticated concept of "false belief"—the recognition that another individual may be mistaken. The classic test for this in people is the "Sally-Anne" experiment. The subject watches "Sally" put a ball in a box, then leave the room. While she's gone, "Anne" moves the ball to a different box. The experimenter asks the subject: Where will Sally look for the ball? The expected answer from adults is the first box, where Sally last saw it. Children younger than about 4, and those with autism, more often say the second box, where the ball actually is; they cannot conceive that Sally has a false belief.

To test if monkeys are capable of false belief, Santos has devised an experiment involving two grapes, three open boxes and four researchers, including Santos herself and someone to record the whole thing on video. Again, the premise is that the monkeys are more likely to steal things that, from their point of view, are unguarded. The protocol is as follows: the three boxes are arranged side by side on the ground with their open sides facing the monkey, and a student puts one grape in each of two boxes—B and C, say. Then she stands behind the boxes and turns her back, and a different student moves the grapes—into A and B. The monkey now knows where the grapes are, but the first student does not. When she turns and faces the monkey, which box is the monkey more likely to rob? If the monkey understands "false belief," it will expect the student to be guarding boxes B and C, and so will be more likely to steal from A.

"Make sure you don't both have your backs turned to the monkey at the same time," Santos warns the students. "Some of these monkeys will just rush the boxes."

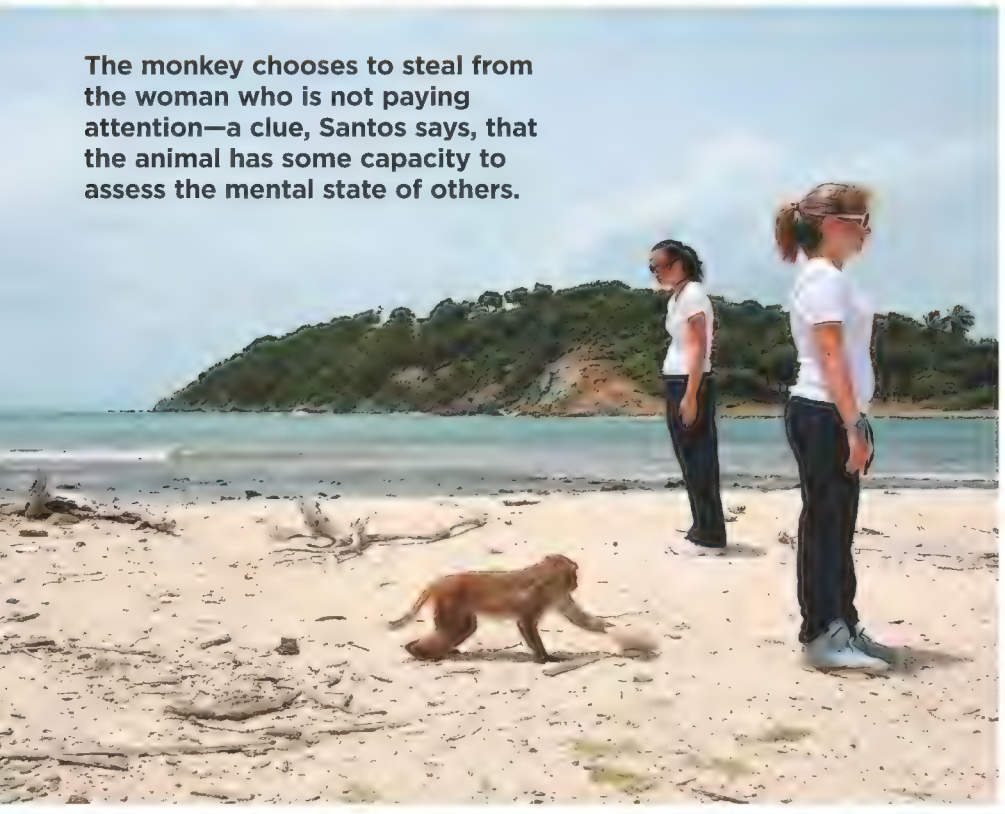
**TRIAL 1:** After finally locating a suitable monkey, setting up the boxes and going through the pantomime with the grapes, Santos drifts back into the trees and watches as the monkey languidly scratches itself. Almost ostentatiously, it seems, the animal turns and looks out over the rocks to the sea.

**TRIALS 2 AND 3:** No approach.

With her students, Santos tramps up and down the

LAURIE SANTOS

**In a test of reasoning devised by Santos and co-workers, a monkey has a chance to steal grapes placed near each volunteer (Olivia Scheck, foreground, and Katharine Jan).**



**The monkey chooses to steal from the woman who is not paying attention—a clue, Santos says, that the animal has some capacity to assess the mental state of others.**

**"The monkey gets to enjoy its prize," says Santos, whose studies have helped overturn the belief that nonhuman primates are incapable of seeing another's point of view.**

now-familiar hills, across a rocky isthmus, to the sounds of wind and crashing waves, chattering monkeys and the continual bang of metal lids slamming on the chow bins. Santos tries to enlist one young monkey gnawing a biscuit, only to be stared down by a nearby male that was about to mount a different female. "Don't worry," Santos says placatingly as she backs away, "she's gonna mate with you, I promise."

**TRIAL 4:** Boxes blow over, trial aborted.

**TRIAL 5:** As soon as the grapes are displayed, the monkey gets up and walks away.

**TRIAL 6:** Finally a monkey that seems interested. Actually, a little too interested. As the second student is approaching the boxes to move the grapes, the monkey gets off his haunches and walks swiftly toward her. "Turn around!" Santos calls. The student pivots, pulls herself up to her full height and stares right at the monkey. It snarls menacingly back at her; she shrieks and runs to hide behind a colleague. The monkey grabs both grapes and runs away, chewing.

STUDENTS MUST COMMIT to a month in Puerto Rico, but it is the prerogative of the professor to fly home at the end of the first week. Before Santos leaves, she makes some modifications to the false-belief experiment, and by the end of the month she hears that it's working better. In the months after returning to New Haven, she begins to formulate some tentative conclusions about what she has found: monkeys can gauge the knowledge and intentions of others when they correspond to their own perceptions of reality, but they cannot make the leap to the concept of a false belief.

So is the mental gap between monkeys and human beings closing or widening? In a sense, both: if Santos is right, monkeys manage to navigate complex social hierarchies, hiding from and deceiving others as necessary, all without an ability that human beings develop by the age of 4. The more she works with monkeys, the more Santos is convinced that their abilities are limited to specific contexts and tasks, such as competing for food or establishing dominance. It's rather like the honeybee dance, a fantastically ingenious way to communicate geographic information. Still, honeybees can't use it to talk about their feelings. "My guess," says Hauser, "is that we will eventually come to see that the gap between human and animal cognition, even a chimpanzee, is greater than the gap between a chimp and a beetle." Perhaps, Santos says. Monkeys can reason quite competently about human beings' intentions with respect to grapes, but only by imputing to them what they themselves experience: a readiness to grab and hoard whenever possible. She speculates that it is our capacity for language that enables us to understand mental states different from our own. We may not be hungry now, but because we have a word for the concept we can imagine what it feels like. "The more you hang out with monkeys," she says, "the more you realize just how special people really are."

SYLWIA KAPUSCINSKI / WPN (3)

Clockwise starting top left: Caño Negro Wildlife Refuge; Tortuguero Park Canal Cruise; White Faced Monkey; Keel Billed Toucan; Manuel Antonio Park; Rainforest Hike

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# Letters From VINCENT

## Never-before-exhibited correspondence from van Gogh to a protégé displays a thoughtful, exacting side of the artist

**BY ARTHUR LUBOW**

The image of Vincent van Gogh daubing paint onto canvas to record the ecstatic visions of his untutored mind is so entrenched that perhaps no amount of contradictory evidence can dislodge it. But in an unusual exhibition at the Morgan Library & Museum in New York City (until January 6), a different van Gogh emerges—a cultivated artist who discoursed knowledgeably about the novels of Zola and Balzac, the paintings in Paris' Louvre and Amsterdam's Rijksmuseum, and the color theories of artists Eugène Delacroix and Paul Signac. The show is organized around a small group of letters that van Gogh wrote from 1887 to 1889, toward the end of his life, during his most creative period.

VINCENT VAN GOGH, *SELF-PORTRAIT*, 1888 / FOGG ART MUSEUM / BRIDGEMAN ART LIBRARY; P. 65 MORGAN LIBRARY AND MUSEUM, NEW YORK; KRÖLLER-MÜLLER MUSEUM / ART RESOURCE, NEW YORK

In the letters, he explained the thinking behind his unorthodox use of color and evoked his dream of an artistic fellowship that might inaugurate a modern Renaissance.

Van Gogh was writing to Émile Bernard, a painter 15 years his junior whom he had befriended in Paris a couple of years before leaving for Provence in early 1888. Of the 22 letters that he is known to have sent Bernard, all but two—one is lost, the other is held in a private collection—are on display at the Morgan, along with some of the paintings that the two artists were then producing and debating. This is the first time the letters have been exhibited. (Unfortunately, Bernard's letters in return are lost.) The bulk of van Gogh's vivid lifetime correspondence—about 800 of his letters survive—was addressed to his brother Theo, an art dealer in Paris who supported him financially and emotionally. Those letters, which constitute one of the great literary testaments in art history, are confessional and supplicatory. But in these pages to the younger man, van Gogh adopted an avuncular tone, expounding on his personal philosophy and offering advice on everything from the lessons of the old masters to relations with women: basically, stay away from them. Most important, to no one else did he so directly communicate his artistic opinions.

Just shy of 18 when he met van Gogh in March 1886, Bernard also impressed Paul Gauguin, whom he encountered in Brittany not long afterward. Two summers later, the ambitious Bernard would return to Brittany to paint alongside Gauguin in Pont-Aven.

Mon cher Bernard Pardonne moi si j'écris bien à la hâte je crains que ma lettre ne sera point lisible mais je veux te répondre tout de suite Sans toi que nous avons été très bêtes Gauguin toi et moi de ne pas aller dans un même endroit. Mais lorsque Gauguin est parti moi j'étais pas encore sur de pouvoir partir Et lorsque toi tu es parti il y avait cet affreux argent du voyage et les mauvaises nouvelles que j'avais a donner desfois ici qui l'ont empeché. Si nous étions partis tous ensemble vers ici ce n'aurait pas été si bête car à trois nous eussions fait le ménage chez nous. Et maintenant que je suis un peu mieux orienté je commence a entrevoir des avantages ici Pour moi je me porte mieux ici que dans le nord - je travaille même en plein midi en plein soleil sans ombre aucune dans les champs de blé et voilà j'en jouis comme une cigale. Mon rêve de à 25 ans j'eusse connu ce pays au lieu d'y venir a 35 à cette époque j'étais enthousiasmé pour le gris ou l'incolore plutôt Maintenant je vois toujours de mieux et plus j'avais des connaissances en théorie dans la catégorie de peintres maudits Pissarro

Voici croquis d'un semeur.
Grand terrain de mottes de terre labourées franchement violet en grande partie
Champs de blé mur d'un ton d'ocre jaune avec un peu de carmin
Le ciel jaune de chrome presque aussi clair que le soleil lui même jaune est jaune de chrome avec un peu de blanc tandis que le reste du ciel est jaune de chrome 1 et 2 mélangés très jaune donc
La blouse du semeur est bleue et son pantalon blanc
Toile de 25 carrée - il y a bien des rappels de jaune dans les fonds
des tons-neutres résultantes du mélange du violet avec le jaune mais je me suis un peu foutu de la vérité de la couleur. J'ai des images naïves
manach de campagne ou la grêle
représentée d'une façon tout à fait
avant de bien trouvé sa mesure
pas la campagne - y ayant elle
des aspirations vers cet infini
mboles. m'enchantent encore comme

**In a letter to his friend, the young artist Émile Bernard, written c. June 19, 1888 (above), van Gogh included a sketch, complete with color notations, of a painting—*Sower with Setting Sun* (left)—that he was working on at the time. Later that year, van Gogh would send a self-portrait (opposite) to Gauguin, who was then with Bernard in Pont-Aven in Brittany.**

**Van Gogh (above, his back to the camera, with Bernard in Asnières c. 1887) met the younger artist in Paris in 1886. They often painted together at Bernard's family home in Asnières, just outside Paris, before van Gogh left for Provence in 1888.**

There, deeply influenced by Japanese prints, the two artists jointly developed an approach—using patches of flat color outlined heavily in black—that diverged from the prevailing Impressionism. Although Bernard would live to be 72, painting most of his life, these months would prove to be the high point of his artistic career. Critics today regard him as a minor figure.

In the Provençal town of Arles, where he settled in late February of 1888, van Gogh, also, was pursuing a path away from Impressionism. At first, he applauded the efforts of Bernard and Gauguin and urged them to join him in the building he would immortalize on canvas as the Yellow House. (Gauguin would come for two months later that year; Bernard would not.) There were serious differences between them, however. Exacerbated by van Gogh's emotional instability, the disagreements would later strain the friendships severely.

Arles, c. April 12, 1888
My dear old Bernard,

. . . . I sometimes regret that I can't decide to work more at home and from the imagination. Certainly—imagination is a capacity that must be developed, and only that enables us to create a more exalting and consoling nature than what just a glance at reality (which we perceive changing, passing quickly like lightning) allows us to perceive.

A starry sky, for example, well—it's a thing that I should like to try to do, just as in the daytime I'll try to paint a green meadow studded with dandelions.

But how to arrive at that unless I decide to work at home and from the imagination? This, then, to criticize myself and to praise you.

At present I am busy with the fruit trees in blossom: pink peach trees, yellow-white pear trees.

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**ARTHUR LUBOW** *wrote about Florentine sculptor Lorenzo Ghiberti's 15th-century gilded bronze doors in the November issue.*

VAN GOGH MUSEUM

I follow no system of brushwork at all, I hit the canvas with irregular strokes, which I leave as they are, impastos, uncovered spots of canvas—corners here and there left inevitably unfinished—reworkings, roughnesses. . . .

Here's a sketch, by the way, the entrance to a Provençal orchard with its yellow reed fences, with its shelter (against the mistral), black cypresses, with its typical vegetables of various greens, yellow lettuces, onions and garlic and emerald leeks.

While always working directly on the spot, I try to capture the essence in the drawing—then I fill the spaces demarcated by the outlines (expressed or not) but felt in every case, likewise with the simplified tints, in the sense that everything that will be earth will share the same purplish tint, that the whole sky will have a blue tonality, that the greenery will either be blue greens or yellow greens, deliberately exaggerating the yellow or blue values in that case. Anyway, my dear pal, no trompe l'oeil in any case. . . .

—handshake in thought, your friend Vincent

Arles, c. June 7, 1888

More and more it seems to me that the paintings that *ought to be made*, the paintings that are necessary, indispensable for painting today to be fully itself and to rise to a level equivalent to the serene peaks achieved by the Greek sculptors, the German musicians, the French writers of novels, exceed the power of an isolated individual, and will therefore probably be created by groups of men combining to carry out a shared idea. . . .

Very good reason to regret the lack of an esprit de corps among artists, who criticize each other, persecute each other, while fortunately not succeeding in canceling each other out.

You'll say that this whole argument is a banality. So be it—but the thing itself—the existence of a Renaissance—that fact is certainly not a banality.

Arles, c. June 19, 1888

My God, if only I had known about this country at twenty-five, instead of coming here at thirty-five—In those days I was enthusiastic about gray, or rather, absence of color. . . . Here's [a] sketch of a sower.

**"The Gauguin is immediately remarkable, but I myself like Bernard's very much," van Gogh wrote upon receiving *Self-Portrait with Portrait of Gauguin* by Bernard (top) and *Self-Portrait with Portrait of Bernard* by Gauguin (above). Van Gogh sent each artist a painting in return.**

Large field with clods of plowed earth, mostly downright violet.

Field of ripe wheat in a yellow ocher tone with a little crimson. . . .

There are many repetitions of yellow in the earth, neutral tones, resulting from the mixing of violet with yellow, but I could hardly give a damn about the *veracity* of the color. . . .

Let's take the Sower. The painting is divided into two; one half is yellow, the top; the bottom is violet. Well, the

"I'm thinking of decorating my studio with half a dozen paintings of *Sunflowers*."

VAN GOGH MUSEUM; VAN GOGH MUSEUM / BRIDGEMAN ART LIBRARY

white trousers rest the eye and distract it just when the excessive simultaneous contrast of yellow and violet would annoy it. That's what I wanted to say.

Arles, June 27, 1888

I have sometimes worked excessively fast; is that a fault? I can't help it. . . .

Isn't it rather intensity of thought than calmness of touch that we're looking for—and in the given circumstances of impulsive work on the spot and from life, is a calm and controlled touch always possible? Well—it seems to me—no more than fencing moves during an attack.

Bernard had apparently rejected van Gogh's advice to study 17th-century Dutch masters and was instead mistakenly—in van Gogh's opinion—emulating religious paintings of such Italian and Flemish artists as Cimabue, Giotto and van Eyck. Before criticizing his junior colleague, however, van Gogh praised those of Bernard's paintings that he felt approached the standards of artists like Rembrandt, Vermeer and Hals.

Arles, c. August 5, 1888

In the first place, I must speak to you again about yourself, about two still lifes that you have done, and about the two portraits of your grandmother. Have you ever done better, have you ever been more *yourself*, and somebody? Not in my opinion. Profound study of the first thing to come to hand, of the first person to come along, was enough to really *create* something. . . .

The trouble is, do you see, my dear old Bernard, that Giotto, Cimabue, as well as Holbein and van Eyck, lived in an obeliscal—if you'll pardon the expression—society, layered, architecturally constructed, in which each individual was a stone, all of them holding together and forming a monumental society. . . . But you know we're in a state of total laxity and anarchy.

We, artists in love with order and symmetry, isolate ourselves and work to define *one single thing*. . . .

The Dutchmen, now, we see them painting things just as they are, apparently without thought. . . .

They make portraits, landscapes, still lifes. . . .

*If we do not know what to do*, my dear old Bernard, then let's do the same as they.

Arles, c. August 21, 1888

I want to do figures, figures and more figures, it's stronger than me, this series of bipeds from the baby to Socrates and from the black-haired woman with white skin to the woman with yellow hair and a sunburnt face the color of brick.

Meanwhile, I mostly do other things. . . .

Next, I'm attempting to do dusty thistles with a great swarm of butterflies swirling above them. Oh, the beautiful sun down here in high summer; it beats down on your head and I have no doubt at all that it drives you loony. Now being that way already, all I do is enjoy it.

I'm thinking of decorating my studio with half a dozen paintings of *Sunflowers*.

**"Have you ever done better, have you ever been more *yourself*, and somebody? Not in my opinion," van Gogh wrote Bernard about the younger artist's portrait of his grandmother (above). "You have never been closer to Rembrandt . . . than then."**

By now, Bernard had joined Gauguin in Pont-Aven in Britanny. As Gauguin's planned sojourn with van Gogh in Arles grew more likely, van Gogh backed away from his earlier invitations to Bernard, saying that he doubted he could accommodate more than one visitor. He also exchanged paintings with Bernard and Gauguin, expressing delight with the self-portraits they sent. But he again voiced his doubts about their practice of painting from the imagination rather than from direct observation of the real world.

Arles, c. October 5, 1888

I really urge you to study the portrait; make as many as possible and don't give up—later we'll have to attract the public through portraits—in my view that's where the future lies. . . .

I mercilessly destroyed an important canvas—a Christ with the angel in Gethsemane—as well as another one depicting the poet with a starry sky—because the form hadn't been studied from the model beforehand, necessary in such cases—despite the fact that the color was right. . . .

I'm not saying that I don't flatly turn my back on reality to turn a study into a painting—by arranging

ÉMILE BERNARD, *PORTRAIT OF BERNARD'S GRANDMOTHER*, 1887 / VAN GOGH MUSEUM

**"Here's a new orchard, quite simple in composition: a white tree, a small green tree, a square corner of greenery—a lilac field, an orange roof, a big blue sky," van Gogh wrote about the sketch (right) he included in his April 19, 1888, letter to Bernard. The drawing represented a painting, *Orchard and House with Orange Roof* (above), he had recently finished.**

PRIVATE COLLECTION; MORGAN LIBRARY AND MUSEUM, NEW YORK

# "...it will be a question of giving strength and brilliance to the sun and the blue sky."

the color, by enlarging, by simplifying—but I have such a fear of separating myself from what's possible and what's right as far as form is concerned. . . .

I exaggerate, I sometimes make changes to the subject, but still I don't invent the whole of the painting; on the contrary, I find it readymade—but to be untangled—in the real world.

On October 23, 1888, Gauguin moved into the Yellow House in Arles with van Gogh, while Bernard remained in Pont-Aven. Initially, the housemates got along well enough, but the relationship became increasingly turbulent. It climaxed violently on December 23, when van Gogh acted menacingly toward Gauguin, then slashed off part of his own left ear. Gauguin returned to Paris, and van Gogh recuperated in a hospital, moved back to his house and then entered an asylum in Saint-Rémy-de-Provence, where he found only aloof doctors and deranged inmates for company. Although he kept in sporadic touch with Gauguin, almost a year elapsed before he would write to Bernard again.

Saint-Rémy, c. October 8, 1889

I hardly have a head for writing, but I feel a great emptiness in no longer being at all up to date with what Gauguin, you and others are doing. But I really must have patience. . . .

Dear God, this is a pretty awful little part of the world, *everything's* hard to do here, to disentangle its intimate character, and so that it's not something vaguely true, but the true soil of Provence. So to achieve that, you have to toil hard. And so it naturally becomes a little abstract. Because it will be a question of giving strength and brilliance to the sun and the blue sky, and to the scorched and often so melancholy fields their delicate scent of thyme.

Bernard sent van Gogh photographs of his recent paintings, including *Christ in the Garden of Olives*. The older artist criticized these works severely, finding them to be inadequately imagined rather than truthfully observed.

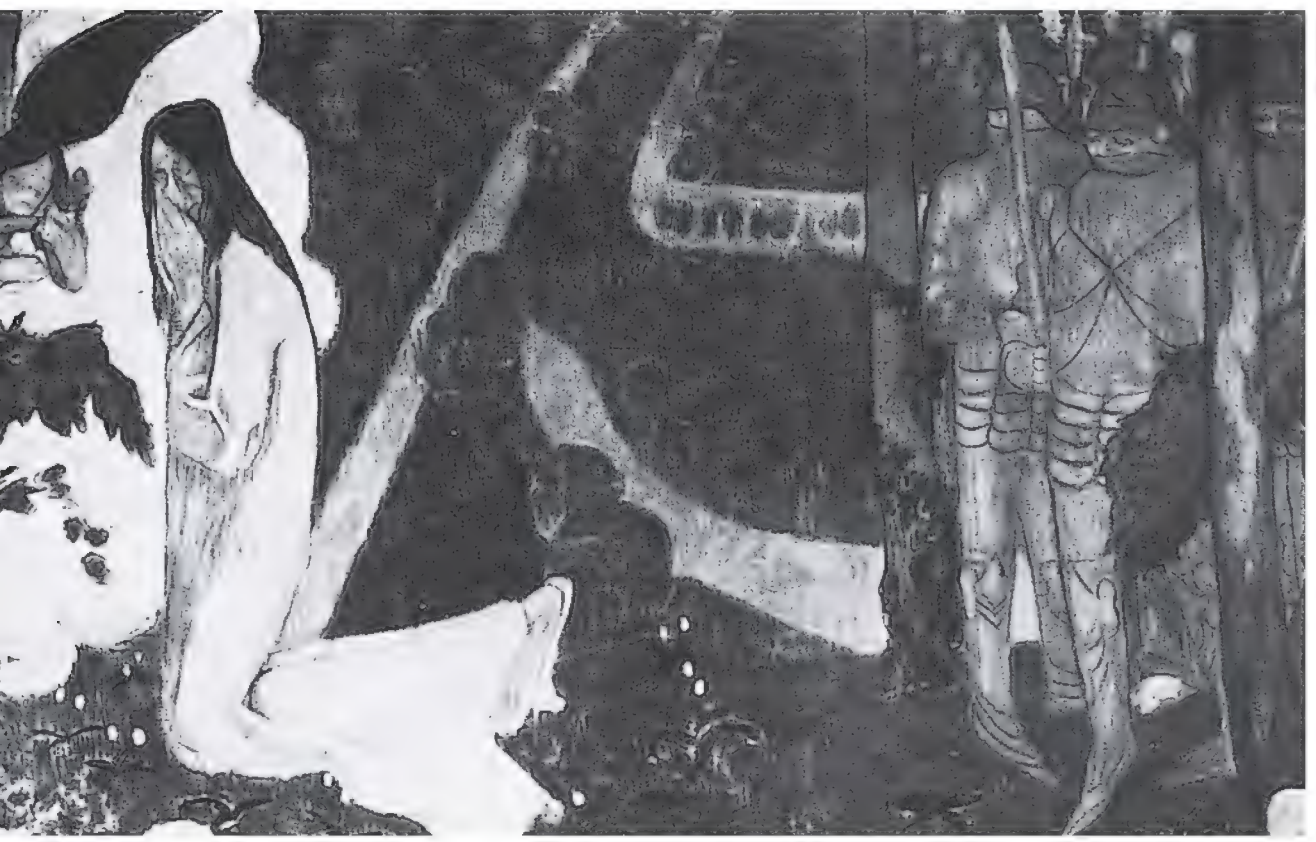
Saint-Rémy, c. November 26, 1889

I was longing to get to know things from you like the painting of yours that Gauguin has, those Breton women walking in a meadow, the arrangement of which is so beautiful, the color so naively distinguished. Ah, you're exchanging that for something—must one say the word—something artificial—something affected. . . .

Gauguin spoke to me of another subject, nothing but three trees, thus the effect of orange foliage against blue sky, but still really clearly delineated, well divided, categorically, into planes of contrasting and pure colors—that's the spirit! And when I compare that with that nightmare of a Christ in the Garden of Olives, well, it makes me feel sad. . . .

My ambition is truly limited to a few clods of earth, some sprouting wheat. An olive grove. A cypress. . . .

Here's a description of a canvas that I have in front of me at the moment. A view of the garden of the asylum where I am. . . . This edge



**"So, they're a setback, my dear fellow, your biblical paintings," wrote van Gogh after he received Bernard's *Christ in the Garden of Olives* (above, a black-and-white photograph of the now-lost 1889 painting). "In order to give an impression of anxiety, you can try to do it without heading straight for the historical garden of Gethsemane."**

RIZZOLI

VINCENT VAN GOGH, *A CORNER OF THE ASYLUM AND THE GARDEN WITH A HEAVY, SAWN-OFF TREE*, 1889 / VAN GOGH MUSEUM

of the garden is planted with large pines with red ocher trunks and branches, with green foliage saddened by a mixture of black. . . .

A ray of sun—the last glimmer—exalts the dark ocher to orange—small dark figures prowl here and there between the trunks. You'll understand that this combination of red ocher, of green saddened with gray, of black lines that define the outlines, this gives rise a little to the feeling of anxiety from which some of my companions in misfortune often suffer. . . . And what's more, the motif of the great tree struck by lightning, the sickly green and pink smile of the last flower of autumn, confirms this idea. . . . that in order to give an impression of anxiety, you can try to do it without heading straight for the historical garden of Gethsemane . . . ah—it is—no doubt—wise, right, to be moved by the Bible, but modern reality has such a hold over us that even when trying abstractly to reconstruct ancient times in our thoughts—just at that very moment the petty events of our lives tear us away from these meditations and our own adventures throw us forcibly into personal sensations: joy, boredom, suffering, anger or smiling.

**"This combination of red ocher, of green saddened with gray . . . gives rise a little to the feeling of anxiety from which some of my companions in misfortune often suffer," wrote van Gogh about his painting of the Saint-Rémy asylum's garden (above).**

This letter ended the correspondence. Despite van Gogh's harsh words, neither man apparently viewed it as a rupture; over the next months, each inquired of the other through mutual friends. But van Gogh's "misfortune" was increasing. He moved from the Saint-Rémy asylum north to Auvers-sur-Oise to be under the care of a genial and artistically inclined physician, Paul Gachet. His psychological problems followed him, however. On July 27, 1890, following another onset of depression, he shot himself in the chest, dying two days later in his bed at the inn where he lodged. Bernard rushed to Auvers when he heard the news, arriving in time for the funeral. In the years to come, Bernard would be instrumental in expanding van Gogh's posthumous reputation, eventually publishing the letters the artist had sent to him. "There was nothing more powerful than his letters," he wrote. "After reading them, you would doubt neither his sincerity, nor his character, nor his originality; you would find everything there."

For more on van Gogh's last days in Auvers visit Smithsonian.com/auvers

On his voyage to the Americas in 1492, the explorer built a small fort somewhere in the Caribbean. A construction contractor from Washington State has spent decades trying to find it

**BY FRANCES MACLEAN**
**PHOTOGRAPHS BY LES STONE**

# The Lost Fort of Columbus

**Christopher Columbus,** anchored somewhere along the island's Atlantic coast, upped sails to begin the long voyage back to Spain with news he had discovered a western route to the Orient. The next day—Christmas, 1492—his flagship, the *Santa María,* lodged in a reef. He ordered his men to dismantle the ship and build a fort with its timbers onshore. Three weeks later, Columbus finally set sail aboard the *Niña*, leaving behind a fortified village, christened Villa de la Navidad, and 39 sailors charged with exploring the coast and amassing gold.

A year later, Columbus returned with 17 ships and 1,200 men to enlarge the settlement. But he found La Navidad in ashes. There were no inhabitants and no gold.

Over the years, many scholars and adventurers have searched for La Navidad, the prize of Columbian archaeology. It is believed to have been in Haiti. The French historian and geographer Moreau de Saint-Méry sought La Navidad there in the 1780s and '90s; Samuel Eliot Morison, the distinguished American historian and Columbus biographer, in the 1930s; Dr. William Hodges, an American medical missionary and amateur archaeologist, from the 1960s until his death in 1995; and Kathleen Deagan, an archaeologist at the University of Florida at Gainesville, in the mid-1980s and again in 2003.

And then there's Clark Moore, a 65-year-old construction contractor from Washington State. Moore has spent the winter months of the past 27 years in Haiti and has located more than 980 former Indian sites. "Clark is the most important thing to have happened to Haitian archaeology in the last two decades," says Deagan. "He researches, publishes, goes places no one has ever been before. He's nothing short of miraculous."

GRANGER COLLECTION, NEW YORK; P. 73 LES STONE / POLARIS

"Anyone living here would have seen Columbus' fleet come along the coast."

What became of the settlement that Christopher Columbus' crew built after his flagship ran aground (left, an 1892 engraving)? Clark Moore (in Haiti near the Bay of L'Acul, where the *Santa María* is believed to have foundered) is on the trail: "We know Columbus built the fort inside a large Indian village."

**Archaeologists believe the remains of Columbus' lost fort lie on Haiti's northern coast, perhaps near Bord de Mer de Limonade.**

Moore first visited Haiti in 1964 as a volunteer with a Baptist group building a school in Limbé, a valley town about ten miles from the northern coast. In 1976, he signed on to another Baptist mission in Haiti, to construct a small hydroelectric plant at a hospital complex in the same town. The hospital's director was Dr. Hodges, who had discovered the site of Puerto Real, the settlement founded circa 1504 by the first Spanish governor of the West Indies. Hodges also had conducted seminal archaeological work on the Taino, the Indians who greeted Columbus. Hodges taught Moore to read the ground for signs of pre-Columbian habitation and to identify Taino pottery.

The Taino, who flourished from A.D. 1200 to 1500, were about 500,000 strong when Columbus arrived. They were reputedly a gentle people whose culture, archaeologists believe, was becoming more advanced. "Taino" means "noble" or "good" in their Arawak language; they supposedly shouted the word to the approaching Spanish ships to distinguish themselves from the warring Carib tribes who also inhabited Hispaniola, the island Haiti shares with the Dominican Republic. Male and female Taino chiefs ornamented themselves in gold, which sparked the Spaniards' avarice. Within a few years of Columbus' arrival, the Taino had all but vanished, the vast majority wiped out by the arduousness of slavery and by exposure to European diseases. A few apparently escaped into the hills.

For two decades Moore has traveled Haiti by rural bus, or *tap-tap*, with a Haitian guide who has helped him gain access to remote sites. Diminutive Haitian farmers watched with fascination as Moore, a comparative giant at 6-foot-2, measured areas in his yard-long stride and poked the soil with a stick. Often he uncovered small clay icons—a face with a grimace and bulging eyes—known to local residents as *yeux de la terre* ("eyes of the earth"), believed to date to Taino times and to represent a deity. Moore bunked where he could, typically knocking on church doors. "The Catholics had the best beds," Moore says, "but the Baptists had the best food."

> "I didn't get the credentials," Moore said. "I didn't play the academic game. But as it turned out, I'm glad."

In 1980, Moore showed some of his artifacts to the foremost archaeologist of the Caribbean, Irving Rouse, a professor at Yale. "It was clear Clark was very focused, and once he had an idea, he could follow through," Rouse recalled to me. "Plus he was able to do certain things, such as getting around Haiti, speaking Creole to the locals and dealing with the bureaucracy, better than anyone else." Moore became Rouse's man in Haiti, and Rouse became Moore's most distinguished mentor. Rouse died in February 2006 at age 92.

**FRANCES MACLEAN** *is a freelance writer in Washington, D.C. Photographer* **LES STONE** *specializes in out-of-the-way stories.*

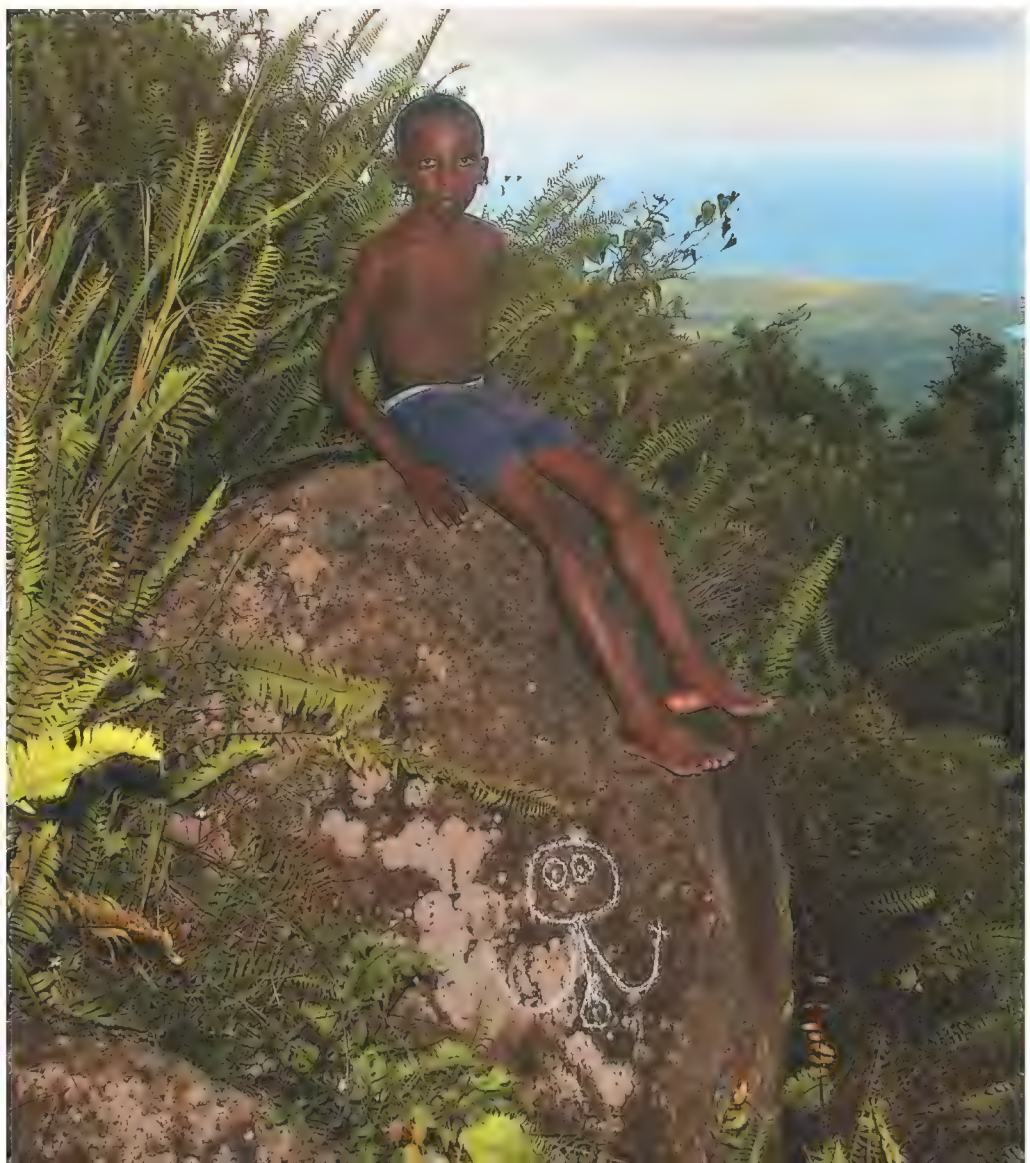
MAP: MIKE REAGAN; P. 75 LES STONE / POLARIS (3)

Rouse encouraged Moore, a 1964 graduate of the Western Washington College of Education, to apply to the Yale Graduate School. His application was rejected. "I didn't get the credentials," Moore said one day as he sipped a cup of strong Haitian coffee on the terrace of a harborside inn in Cap-Haïtien. "I didn't play the academic game. But as it turned out, I'm kind of glad. If I had, I'd be excavating five-centimeter holes with all the others, drowning in minutiae."

THE RENTED Jeep rocketed between ruts in the mountain road to Dondon, an old market town about 20 miles from Cap-Haïtien. Haiti's history has marched over this road, originally a Taino thoroughfare, from colonial times, when coffee and sugar plantations enriched France, to the slave revolts of the 1790s (which led to Haiti's independence in 1804 and the world's first black-governed republic), to the 19-year U.S. occupation begun in 1915, to the rebels' toppling of President Jean-Bertrand Aristide in 2004. (Haitians elected a new president, Réne Préval, in February 2006. More than 8,000 United Nations peacekeeping forces deployed in Haiti since 2004 are credited with quelling political unrest and violent gangs and reducing drug trafficking.) Moore turned the Jeep onto a side road, and we stopped in a clearing near a river. Shouldering water jugs and lunch, a pair of guides led us across it.

As we hiked, Moore explained the theory behind his search for La Navidad. He takes what might appear to be an indirect approach, locating as many former Indian sites as possible. That's partly because it is believed that Columbus built the fort inside an Indian village. "The Taino built a large village inland every 12 miles and paired it with a smaller village on the coast," he says. "The small village took care of the boats, caught shellfish and such to feed the larger. I mark the map with each village I find. A pretty pattern. I think it will eventually show where La Navidad was."

**Much of Haiti, the hemisphere's poorest nation, remains unexplored by archaeologists (above, pre-Columbian shards found in a shell refuse pile). Traces of the ancient Taino Indians, who greeted Columbus, are seen in petroglyphs (below left, near the Bay of L'Acul). Caves that Tainos used centuries ago for worship (below right) serve a similar function today for voodoo practitioners.**



**"He's nothing short of miraculous," one scholar says of Moore (third from left, with assistants near Bord de Mer de Limonade).**

The guides stopped in front of a cave hidden by brush and ropy liana vines. Caves were holy places to the Taino. They believed that human life originated in one, and that people popped the earth after a guard at the cave entrance left his post and was turned to stone. Before entering a sacred cave, the Taino made an offering to the spirits. Because they did not believe in blood sacrifice, they gave the contents of their stomachs, an act aided by beautifully carved tongue depressors.

A mellow light filled the cave's large, domed entry chamber; to one side, a row of heads resembling a choir or jury was chiseled into the face of a boulder, their mouths wide open in an eternal song or scream. Fierce-faced carved figures marched across the opposite wall. The Taino carvings appear to warn intruders to stay out. Moore has no explanation for the figures' expressions. "I leave interpretation to others," he says. A tiny elevated room held the source of the light: a chimney hole latticed with greenery. Stick figures held forth on a wall. Candle butts and an empty bottle rested in an altar niche carved in a boulder. Under the bottle lay folded papers that Moore did not read. "Voodoo," he said.

One night, when Moore was entertaining friends at his harborside cinder-block house in Cap-Haïtien—he lives there with his wife, Pat, a nurse from Nebraska with 16 years' service in Haiti's rural clinics—the conversation turned to the fate of the Taino. "The Taino really weren't all wiped out," Moore said. "There are groups in New York, Puerto Rico and Cuba who call themselves the descendants. They're reviving the language and ceremonies and want the world to know 'Hey, we're still here.'"

"The descendants in Haiti are secretive," a visiting archaeologist chimed in.

A GUIDE NAMED Jean Claude led Moore up a narrow mountain trail to a high, flat ridge that could be reached only by climbing three other mountains, a destination recalling the Creole proverb, *Deyo mon ge mon* ("Beyond the mountains are more mountains"). Jean Claude's brother had found a site he thought Moore should see.

The ridge had dark brown soil, which Moore said indicated that fires had burned there long ago. He took the GPS coordinates and then probed the soil with a stick, pulling out large potsherds and many seashells. There were three Indian houses here, Moore concluded. "I'm standing in the garbage dump."

Moore sat down and adjusted his hat against the sun. We were at 1,700 feet, and the trade winds dried the sweat as soon as it broke. "A fine place for a house at any time," Moore said. "Lookouts would have lived here," he added, pointing to the sweep of Atlantic coastline on the horizon. "Anyone living here would have seen Columbus' fleet come along the coast. They would have seen the fires lit by other lookouts to mark its progress, then lit their own to warn people down the way that invaders were here."

He went on: "Invaders they were. They made slaves of the Indians, stole their wives. That's why the Indians killed the *Santa María* crew and burned La Navidad." He gestured at a point on the horizon. "Bord de Mer de Limonade. That's where I think La Navidad is. Samuel Eliot Morison thought so. Dr. Hodges too.

"When I come back, I'll do a little spade-excavating there, at least eliminate it," Moore said. "Of course the coastline will have changed since 1492. We'll see."

LES STONE / POLARIS

**Learn more about Clark Moore's work in Haiti at Smithsonian.com/haiti**

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# THE *SMITHSONIAN* LIFE LIST

## With so many wonderful places to visit, how can one choose? Keeping our readers' interests in mind, we've traveled the globe in search of destinations certain to inspire

"WE ARE ALL OF US resigned to death: it's life we aren't resigned to," novelist Graham Greene once wrote. A growing number of Americans of all ages are embracing that idea by renewing a resolve to live life to its fullest.

Exhibit A is the recent popularity of "life lists"—itineraries of things to do and places to go before taking the ultimate trip to the Great Beyond. Bookstores brim with titles such as *1,000 Places to See Before You Die*, *1001 Paintings You Must See Before You Die* and—for the high-minded—*Fifty Places to Go Birding Before You Die*. A cottage industry of Web sites has also popped up, enabling life list enthusiasts to exchange ideas ranging from learning Japanese to getting a tattoo. Now even Hollywood has gotten into the act, with the release this month of the film *The Bucket List*, in which two cancer patients, played by Jack Nicholson and Morgan Freeman, break out of their medical ward and embark on a life list road trip that includes dining on expensive caviar and gambling in Monte Carlo.

Life list experts (yes, there are such beings) advise people not to set themselves up for disappointment by trying to accomplish too much. (When's the last time you completed your *daily* to-do list?) With the entire world to choose from, the maxim "so much to do, so little time" takes on added meaning.

To that end, the staff of SMITHSONIAN—as diverse a group of travelers as you're likely to meet—put their heads together to come up with an exclusive list of 28 places the SMITHSONIAN reader might wish to visit before . . . it's too late. Some of the sites are portals into the past—ancient cities so well preserved that visiting them is like stepping into a previous century. Others feature feats of engineering or sublime works of art—or, in the cases of the Taj Mahal and Frank Lloyd Wright's Fallingwater, both. Travelers can visit temples and churches so breathtaking they must have been built with divine inspiration. For the more adventurous, we offer rewards beyond mere sightseeing—from a three-day hike across the Grand Canyon to a ride along China's Yangtze River.

While all of these destinations beckon year-round, there are places where timing matters: many travelers are at a loss for words after witnessing the sun rise over Machu Picchu or seeing Iguazu Falls by the light of a full moon. And, appropriately, some of our sites now confront their own mortality—endangered by pollution or just worn down, like a few of us, by the passage of time.

Whether you visit only a couple of these destinations or all 28, your life will be enriched by the experience. And if along the way you want to gorge on caviar or get a tattoo, that's entirely up to you.

Florence's Uffizi Gallery has been displaying great art (Botticelli's *Birth of Venus*) since 1574. "Every room is full of masterpieces" that chart how the Renaissance developed, says Syracuse University's Gary Radke.

# 28 PLACES TO SEE BEFORE YOU DIE

# PORTALS INTO THE PAST

## Walk the timeless streets and byways of ancient cities on three continents

## Mesa Verde

Mesa Verde's cliff dwellings are a little crumbly in places, and looters took away most of the pottery and baskets a century ago. But as you explore the southwestern Colorado national park, it's easy to imagine the lives of the Ancestral Pueblo Indians who built these cliff houses 800 years ago.

Ancestral Puebloans grew squash, corn and beans on the mesa and lived in simpler pit houses as early as A.D. 600. They began building cliff houses in the 1200s: multistory structures of sandstone bricks and mortar, tucked into deep rock alcoves.

The building boom occurred during a time of plenty. Archaeological research reveals that the first cliff dwellers ate deer and bighorn sheep and had tall, straight timbers for their roofs. Then came the lean years, according to park ranger Paul Ferrell. People hunted out the big game and deforested the mesa. In 1276 a 23-year drought began. The Ancestral Puebloans abandoned the site by 1300.

Cowboys found the cliff dwellings in the 1880s and subsequent explorers plundered them—until much of the mesa was turned into a national park in 1906. That protection, plus the arid climate and the shelter from overhanging rocks, beautifully preserved the cliff dwellings as well as artwork chiseled into cliff faces.

If you're not too bothered by climbing steep ladders or crawling through tunnels, you can tour several of the sites, including the largest cliff dwelling in North America. In some dwellings you can still see ceilings blackened by hearth smoke. —LAURA HELMUTH

## Pompeii

Pompeii's history reads like a Greek tragedy. Settlers originally flocked to the site of the Roman port city because of its fertile soil—the product of volcanic ash from nearby Mount Vesuvius. Yet that very same volcano would erupt and doom the city of 10,000 to 20,000 inhabitants in A.D. 79.

Many Europeans toured the city's ancient ruins in the decades following their initial excavations in 1748. Indeed, Pompeii became all the rage across the continent, inspiring a gaudy revival in Classical art and architecture.

But for archaeologists and present-day visitors, the real thrill of Pompeii is that the most mundane aspects of ancient Roman life have been preserved for centuries beneath fine-grained volcanic ash. Graffiti still covers walls; some of the excavated bakeries had bread loaves in their ovens. (The National Archaeological Museum in nearby Naples displays many of the most important finds.) Visitors to the city can tour homes such as the House of the Vettii—a residence of wealthy merchants, with walls adorned with frescoes depicting scenes from classical mythology.

Among the most moving sights is the Garden of the Fugitives, which displays plaster casts of some of the victims in their final moments of life. "It adds an extra dimension to Pompeii," observes Rick Jones, an archaeologist at the University of Bradford in England, who has conducted research at the site since 1994. "It creates a sense of intimacy, a connection to the people who lived there." —MARK STRAUSS

GEORGE H. H. HUEY; ROGER RESSMEYER / CORBIS; PP. 78-79 FRANCO ORIGLIA / GETTY IMAGES

GREG JOHNSTON / LONELY PLANET IMAGES; PAULE SEUX / HEMIS / CORBIS

# Tikal

I was only 7 years old when I visited Tikal. Along with other children, I broke away from the tour group and wandered among the chambers inside the ancient Mayan edifices. I ran my hands along the walls, imagining that if I pressed a stone just so, a secret chamber would open, revealing treasure or a royal sarcophagus.

No such luck—but that didn't diminish the mystery that enshrouds the ancient city in Guatemala. Founded in 200 B.C., it emerged as a regional superpower that dominated other city-states stretching from the Yucatán Peninsula to western Honduras. Tikal's reign abruptly ended when, for unknown reasons, the Mayans abandoned the city in A.D. 900. Enveloped by jungle, it would not be rediscovered until 1848. Since then, only 15 percent of the site has been excavated.

But what can be seen above ground is the archaeological equivalent of shock and awe. Six temple pyramids dominate the skyline, the tallest of which, Temple IV, stands 212 feet high. Visitors can scale it by means of wooden ladders and protruding roots. Temple VI lays claim to the most extensive hieroglyphics in the Mayan world, narrating the city's dynastic history.

When asked to choose one word to describe Tikal, David Stuart, a professor in the department of art and art history at the University of Texas in Austin, responds: "Vertical."

"The design of those buildings was meant to impress," says Stuart, who has visited the city a dozen or so times during the past 20 years, "and it still works."

—MARK STRAUSS

# Petra

"Petra" is the Greek word for "rock." But the Arabic term, *al-madina al-wardah* (rose-colored city), far better evokes the beauty of this enigmatic site.

Located in western Jordan, Petra was built in the first century B.C. by an Arab tribe, the Nabateans, who made it the capital of a prosperous mercantile empire. High walls and surrounding mountains served as intimidating defenses against raiders tempted to plunder the city's wealth. The main entrance, the Siq, is a twisting gorge so narrow in some places that only two camels can pass at a time.

Today, as then, visitors approaching through the Siq suddenly behold a stunning metropolis carved from sandstone. One of the first sights is Petra's most recognizable building, Al Khazneh, commonly called "the Treasury" (although it is, in fact, believed to be a large tomb).

The city remained well preserved largely because it was forgotten. Petra fell into decline following earthquakes in the fourth and sixth centuries A.D. It was not even on Western maps until it was rediscovered in 1812 by the Swiss traveler Johann Ludwig Burckhardt.

Nowadays, Petra once again bustles with human activity. Tourists began flocking there in greater numbers after it was featured in the 1989 film *Indiana Jones and the Last Crusade*. With up to 5,000 visitors a day to the site, some people—among them Jane Taylor, who has photographed Petra for more than 20 years—worry that it could become endangered, possibly prompting restrictions on access. "One of the beauties of Petra," she explains, "has been our freedom to climb wherever we want."

—MICHELLE STRANGE

# FEATS OF ENGINEERING

## The world's surviving architectural wonders hewed from stone and mortar beckon as ever

## Pyramids of Giza

The Pyramids of Giza rise from the west bank of the Nile River almost as an act of defiance, perfectly symmetrical behemoths imposed upon a flat, barren landscape. The Great Pyramid—the oldest, largest and most famous of the monuments—is the last of the ancient world's "seven wonders" still standing. Built 4,500 years ago as a tomb for the fourth dynasty pharaoh Khufu, it once stood 481 feet high. Because thieves (who robbed the burial chambers) stripped the pyramids of their outer casings of polished white limestone, they no longer reach their original heights. Today the Great Pyramid stands at 450 feet.

Precisely how the Egyptians built these colossal structures is still a matter of debate. To construct the Great Pyramid, workers had to cut, haul and assemble 2.3 million limestone blocks, weighing on average more than two tons. Contrary to the long-held belief that the workers were slaves, Egyptologists now believe the pyramids were ancient public works projects (which, unlike modern public works projects, actually got finished).

Erected as a vanity effort by a ruthless pharaoh, the pyramids remain first and foremost a monument to the ingenuity of a remarkable civilization. As Jean-Pierre Houdin, a French architect who has studied the Great Pyramid for almost a decade, observes, "You don't build such a mountain of stones with so few people this size unless you have reached a very high level of knowledge in many sciences."

## Taj Mahal

Every year for the past decade or so, more than three million travelers have visited India's Taj Mahal. The white marble monument—completed over some 15 years by the emperor Shah Jahan as a memorial to his wife, Mumtaz Mahal, who died in childbirth in 1631—rises on a three-acre site on the Yamuna River in the northern city of Agra.

By the mid-1990s, the Taj's splendors—such as the 187-foot, minaret-flanked dome, fronted by a reflecting pool and surrounded by a walled garden—had deteriorated markedly, prompting a multimillion-dollar restoration effort spearheaded by the Indian government. The massive undertaking includes scrubbing the marble exterior and a restoration of the massive red sandstone main gates, including the replacement of semiprecious inlay.

The restoration is expected to take several years. Even before the scaffolding comes down, however, visitors will discover that the monument's aura of serenity—long associated with this symbol of romantic love—remains intact. Today, access to the site is regulated by the use of timed tickets; visitors stroll among the gardens and gleaming interior spaces in an atmosphere closer to the tranquillity envisioned by Shah Jahan himself. This significant preservation project, says Bonnie Burnham, president of the World Monuments Fund, demonstrates the progress that can be achieved by "public-private partnerships." Long-term plans, she adds, include a re-creation of the site's original gardens.

—KATHLEEN BURKE

FRANS LEMMENS / ZEFA / CORBIS; BOB KRIST / CORBIS

# Easter Island

About 2,000 miles off the coast of South America sits the Chile-governed Easter Island. Just 14 miles long and 7 miles wide, it was named by Dutch explorer Jacob Roggeveen, who discovered it on Easter Sunday in 1722. Archaeologists and historians have debated the island's history, but it is believed that Polynesians landed on the island around A.D. 800 and depleted its resources until it was practically barren.

What they left behind, however, remains one of the most captivating riddles of engineering: nearly 1,000 monolithic statues. The massive effigies, on average 13 feet tall and weighing 14 tons, are thought to represent ancestral chiefs raised to the level of gods. According to archaeologist Jo Anne Van Tilburg—who is the founder of UCLA's Easter Island Statue Project and has studied the artifacts for nearly 30 years—about 95 percent of the statues were carved in the volcanic cone known as Rano Raraku. Master carvers, who taught their craft over generations, roughed out the statues using stone tools called *toki* and employed sharp obsidian tools to make finer lines.

The real mystery—how a small and isolated population managed to transport the megalithic structures to various ceremonial sites—has spawned decades of research and experiments. "It is amazing that an island society made of 10 to 12 chiefdoms had sufficient unity and ability to communicate carving standards, organize carving methods and achieve political rights of way . . . to transport statues to every part of the island," Van Tilburg says. —JESS BLUMBERG

# The Great Wall

At Simatai, a two-hour drive from Beijing, there's an access point to the Great Wall, in north Miyun County. Three years ago, I hiked a dirt trail from this site's long-deserted turnstile entrance and scaled the wall's steep, crumbling steps. I felt I was conquering, not climbing, the Great Wall.

In the absence of known facts, many legends have buttressed the wall's lore. "The myths show that the earliest viewers of the wall from Europe [in the 1700s] really grappled with words to describe the immensity of the structure they saw," says William Lindesay, director of the International Friends of the Great Wall. "It was soon realized that there was no single summit from which viewers could survey the entire wall, hence imagination took to speculation." In the years that followed, the wall's length was estimated to be anywhere from about 1,500 to 31,250 miles. But the structure is actually multiple walls—dating from the 7th century B.C. to the 17th century A.D.—some of which are only now being surveyed. Current estimates place its length, with all the branches and sections, at 4,500 miles.

As the sun rose after a sleepless night at Simatai, I went from feeling like a big, bad adventurer to a blip in the wall's dark shadow. "It's the collective work of perhaps hundreds of millions of laborers," says Lindesay, who has trekked some 1,500 miles of it. "And it will probably never be surpassed in scale." —MEGAN GAMBINO

ALISON WRIGHT / CORBIS; KEREN SU / CORBIS

# A MATTER OF TIMING

## Choosing the right year, month or even moment can make all the difference

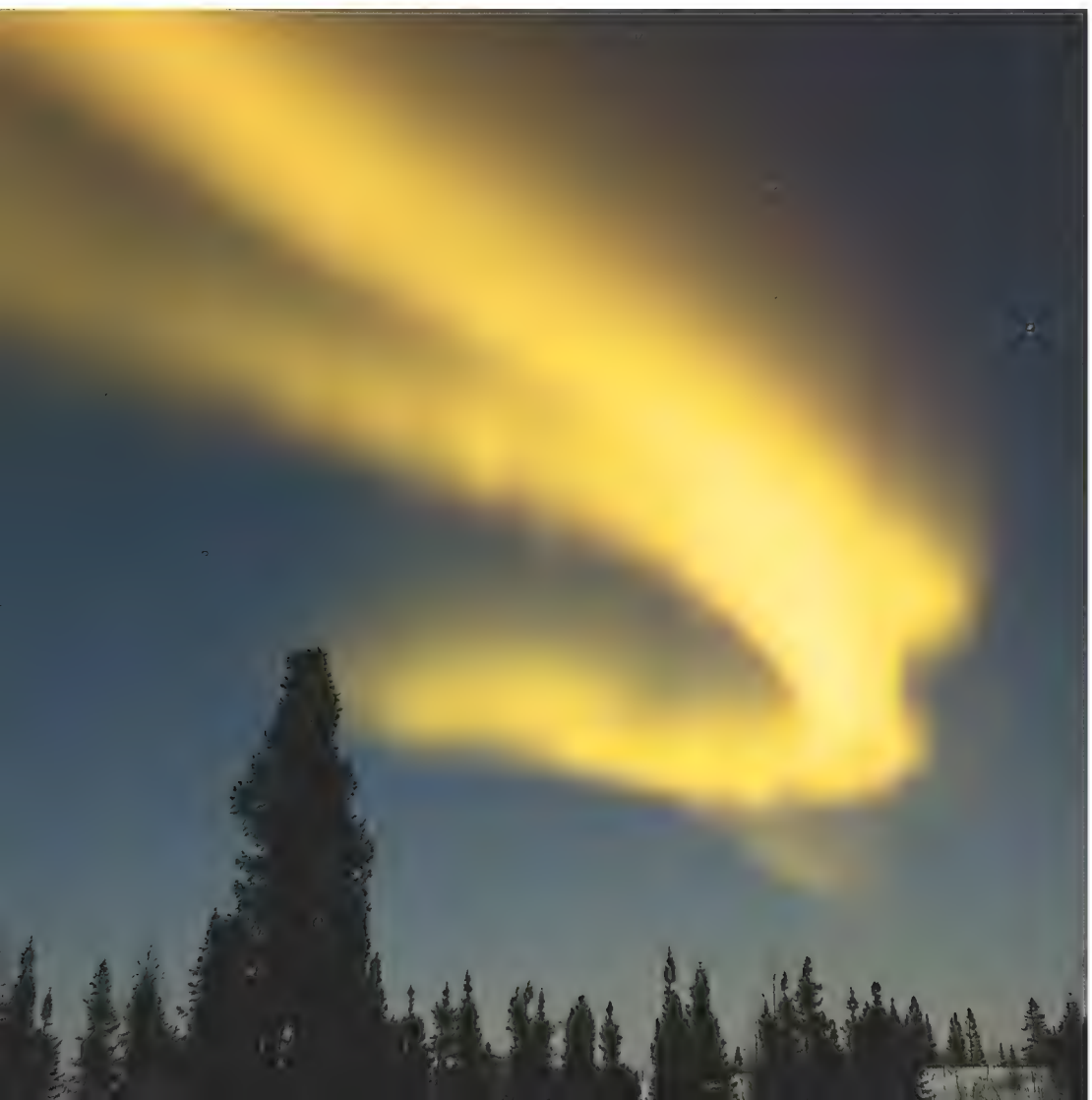
## Aurora Borealis

Never mind the grizzly bears, the glaciers and the tundra. The best reason to go north (to Alaska, the Yukon or anywhere else above about 60 degrees latitude) is to see the Northern Lights.

Try to imagine the most colorful, textured sunset you've ever seen, then send it swirling and pulsing across an otherwise clear and starry sky. Maybe add some faint outlines of mountains on the horizon and a hooting gray owl for ambience.

But even more fabulous, in its own way, is the physics. Your planet is being buffeted by solar wind—particles of protons and electrons that the sun spews into space. Some of the charged particles get sucked into the earth's magnetic field and flow toward the pole until they collide with our atmosphere. Then, *voilà*: the aurora borealis (or aurora australis, if you happen to be at the bottom of the Southern Hemisphere).

The best times to see the aurora are around the fall and spring equinoxes, according to Janet Green, a physicist at the National Oceanic and Atmospheric Administration (NOAA), when geomagnetic storms—disturbances in the earth's magnetic field—are strongest. It helps if the sun is near a peak of activity in its 11-year sunspot cycle. You can sign up for aurora alerts online or keep an eye on NOAA's geomagnetic storm forecast. But most of all you need a cloudless night, a flask of something warm and bracing, and pepper spray in case a grizzly tries to join you for the show. — LAURA HELMUTH



## Serengeti

Each year, the primal drama of survival plays out on an epic scale on the plains of the Serengeti. An estimated one-and-a-half million wildebeests, along with hundreds of thousands of zebras and gazelles, make a 300-mile circuitous journey across the vast grasslands that stretch across northern Tanzania, then west toward Lake Victoria, east to the Ngorongoro highlands and north into Kenya. Lions, cheetahs and hyenas tenaciously pursue their prey, while hordes of crocodiles hunker down in the Mara River, eager to pick off wildebeests struggling across swift currents.

The Serengeti ("land of endless space" in Masai) is the only place in Africa where migrations of this magnitude occur. The wildebeests follow the trajectory of the seasonal rains that nourish the fresh grass on which they graze.

Aside from the long rains that drench visitors in April and May, the Serengeti is a year-round destination—although what you see can vary depending upon when and where you go. Predators tend to congregate during the calving season in the southern plains of the Serengeti National Park from January to March, when the young wildebeests are at their most vulnerable. To see the Mara River crossings in Kenya, the best time to visit is September and October.

The mass migration is what defines the Serengeti, say photographers Jonathan and Angela Scott, who visited the site for nearly 25 years for their book *Mara-Serengeti: A Photographer's Paradise*. "It patterns the lives of other animals. The wildebeests are the architects of the plains."

— LYN GARRITY

MITSUAKI IWAGO / MINDEN PICTURES; M. WATSON / ARDEA; P. 85 RUTH WRIGHT; KEVIN SCHAFER / CORBIS

# Iguazu Falls

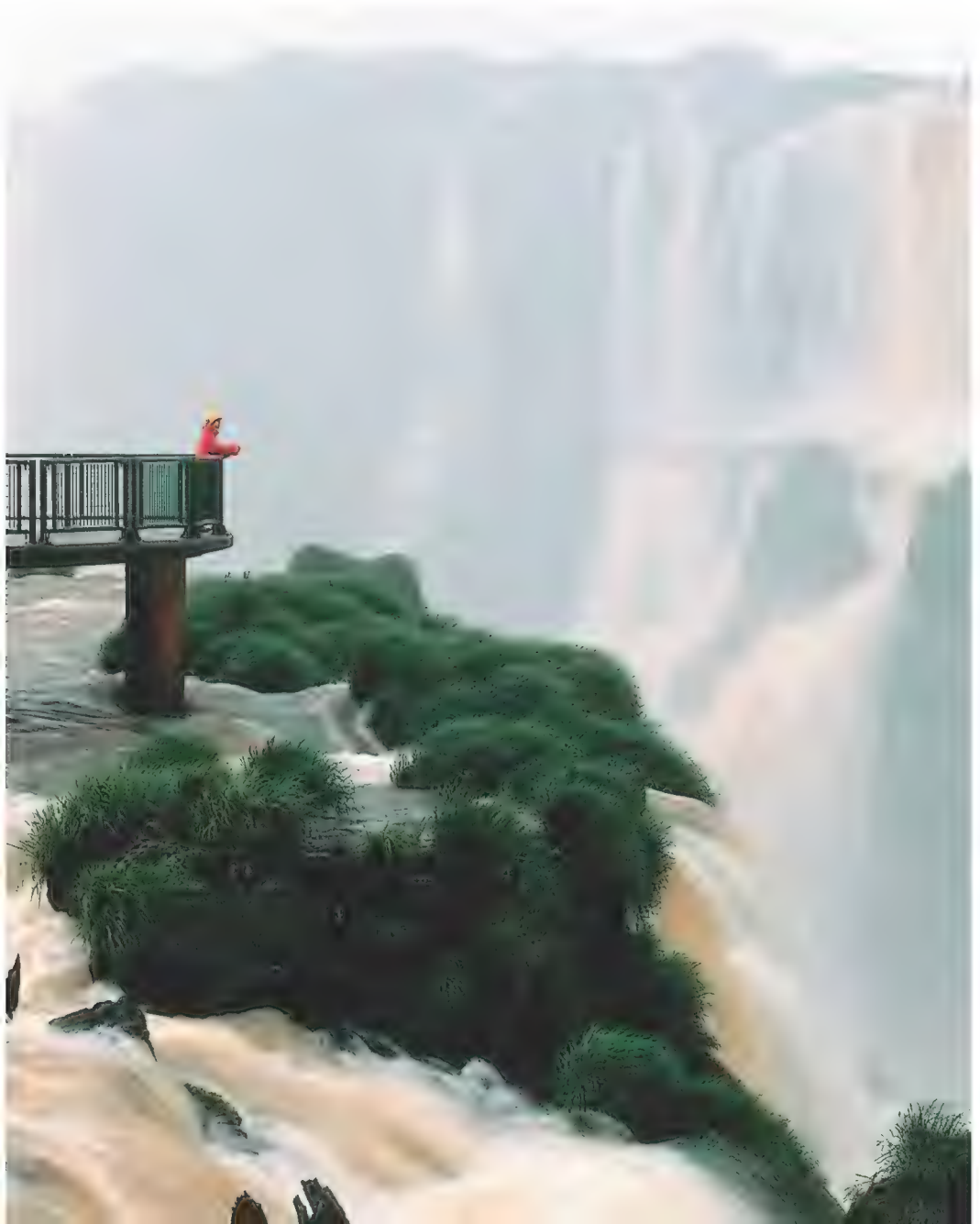
"Muggers you won't have to worry about" advised the concierge at Hotel das Cataratas in Brazil. "Nobody ever goes down there at night. Just watch out for snakes on the trail."

Nobody is more snake-phobic than I am, but I couldn't resist seeing Iguazu Falls by the light of a full moon. Iguazu is a series of more than 200 separate waterfalls strung along 230-foot-high cliffs on both sides of a narrow gorge. At my side I could see and feel several falls right next to me. Across the gorge, in the illuminated night, a few dozen more emerged and faded into the mist like apparitions.

Only Victoria Falls, between Zambia and Zimbabwe in southern Africa, rivals Iguazu in grandeur. But the sheer variety of vistas at Iguazu—located near where Paraguay, Brazil and Argentina meet—give these falls a special edge.

January through March, when the river is high, is the best time to appreciate the wonders of Iguazu Falls. Nowadays, however, nighttime access to the trails is mostly restricted, except for organized group walks on full-moon nights. Boat tours and an extensive system of walkways and viewing platforms offer a wealth of views. Even veteran travelers gape at the sight. "I was awestruck," says Mara Vorhees, a co-author of Lonely Planet's forthcoming guide to Brazil. "You're nearly completely surrounded by enormous thundering water. Above there was a rainbow—a rain ring, really, since it nearly formed a circle. I couldn't stop looking."

—BRUCE HATHAWAY



# Machu Picchu

Machu Picchu, the royal retreat of the Incan emperor Pachacuti, sits atop the Urubamba Valley in Peru. Meaning "Old Mountain" in the Quechua Indian language, the complex was constructed in the 15th century as a place for the emperor and his retinue to relax, hunt or entertain foreign dignitaries.

The site also boasts Huayna Picchu Mountain, which looms nearly 1,000 feet above terraces, plazas and stone ruins as mists swirl up from the Urubamba River. After the Spanish conquest in 1532, jungle growth enveloped the structures and temples. In 1911, Yale historian Hiram Bingham stumbled upon the "lost city of the Incas." Since then, its magnificent setting and detailed stonework have captivated countless visitors.

There is never a wrong time to see Machu Picchu, but the ideal moment to experience the vista is during the rise of the Inca's most powerful deity, the sun. (Spend the night in Aguas Calientes, at the base of Machu Picchu, to catch the sunrise.) Photographer Ruth M. Wright, who has studied Machu Picchu for 30 years (see above) and co-authored *The Machu Picchu Guidebook: A Self-Guided Tour*, says the best view is from the Guardhouse, where a visitor can anticipate the sun with nothing more than a llama grazing in the distance. "As the golden rays slip down Huayna Picchu, the buildings on the ridge below start to emerge from the shadows until Machu Picchu is presented in all its glory," she says. "It is a breathtaking, almost spiritual experience, and one you will never forget." — JESS BLUMBERG

# TRIUMPHS OF VISION

## Come face to face with history's finest works of art and design

## The Louvre

*The Mona Lisa*. *The Venus de Milo*. *The Winged Victory of Samothrace*. The collection in the Louvre Museum in Paris is an Art History 101 checklist. And yes, you must see the works in person. No photograph or Web site has the same impact as standing dwarfed before the myriad intricacies of Renaissance painter Paolo Veronese's 22-foot-tall *Wedding Feast at Cana*. But a pick-and-choose tour of famous masterpieces ignores the full scope of the collection. Begun by King François I in 1546, the 35,000 pieces are a narrative of artistic vision from antiquity through the mid-19th century.

The Louvre is the granddaddy of public art museums. In 1793 the medieval fortress-turned-royal palace was opened to all the people by order of the French Revolutionary government. Fostered later by Napoleon, who understood the propaganda value of a collection of world masterpieces, it was also a center for the education of artists. "The Louvre was the inspiration for other art museums," says Andrew McClellan, author of *Inventing the Louvre* and a professor of art history and museum studies at Tufts University. "It is the quintessential example of the museum idea: that you can go into one place and confront the surviving products of distant cultures and the finest things that have ever been made."

So how to take it all in? "The only way to do it is to go back repeatedly," counsels McClellan, who estimates he's visited about 75 times. In the words of Paul Cézanne, "Keep good company—that is, go to the Louvre."

—ALISON MCLEAN

## Zen Garden of Kyoto

Zen rock gardens, or *karesansui* (translated as "dry-mountain-water"), originated in medieval Japan and are renowned for their simplicity and serenity. The most famous of these can be found in Kyoto at the 15th-century Ryoan-ji, the Temple of the Peaceful Dragon. "While there are other similar gardens of great beauty," says James Ulak, curator of Japanese art at Smithsonian's Freer and Sackler galleries, "Ryoan-ji remains the ur-site of the type—powerful, abstract, Zen Buddhist landscapes designed to invoke deep meditation."

Measuring 98 by 32 feet, the Ryoan-ji garden is about the size of a tennis court and is composed solely of 15 large and small rocks, some encircled by moss, grouped in five clusters on a bed of carefully raked white sand. From a distance, the rocks resemble islands, the sand a tranquil sea.

In 2002, a research team at Kyoto University claimed to have cracked the Zen code. Relying on computer models, they found that the garden's rocks—when viewed from the proper angle—subconsciously evoke the tranquil outline of a branching tree. Over the centuries, however, visitors have discerned images as diverse as a tigress escorting her cubs across water and the Chinese character for "heart" or "mind." Since the anonymous designer left no explanation, the garden's exact meaning remains a mystery, which no doubt contributes to its enduring allure.

What will you see?

—KAREN LARKINS

CARO / SORGE / DRR.NET; MARTIN GRAY / NATIONAL GEOGRAPHIC IMAGE COLLECTION

# Uffizi Gallery

When word flashed around the globe that a car bomb had exploded outside Florence's Uffizi Gallery in May 1993, the world's art community let out a collective gasp. Home to a priceless collection of Renaissance art and other masterpieces, including Sandro Botticelli's *Birth of Venus* and Leonardo da Vinci's *Annunciation*, the Uffizi is one of the world's oldest museums. The *palazzo* that houses the gallery was designed by architect and painter Giorgio Vasari and begun in 1560 for Cosimo I de'Medici, grand duke of Tuscany. Originally built as government offices (*uffizi*), the building became a venue for the display of art in 1574, when Cosimo's son Francesco I transformed the top floor into a place "to walk in with paintings, sculptures and other precious things."

Since the Uffizi opened to the public in 1769, it has survived World War II bombing raids and a disastrous flood in 1966. The 1993 car bomb, believed to have been the work of the Sicilian Mafia, caused less damage than feared. Only three paintings were deemed beyond repair.

The resilience of the Uffizi is appropriate for the city that defied conventions and saw the birth of the Renaissance. "Every room is full of masterpieces, and together they chart, almost decade by decade, how the Renaissance developed," says Syracuse University professor Gary Radke, a specialist in Italian Renaissance art. "Spend time with the masterpieces, examine them closely and come back again."

—DIANE M. BOLZ

# Fallingwater

If the skyscraper is America's most iconic building, a small personal residence in southwest Pennsylvania might be its most ingenious. Frank Lloyd Wright completed Fallingwater in 1937, and months later *Time* magazine put the house on its cover, proclaiming it the architect's "most beautiful job." Ayn Rand based much of her 1943 classic, *The Fountainhead*, on Wright and the house he had wrought.

Wright designed it in 1935, at his professional nadir, as a mountain retreat for Pittsburgh retail mogul Edgar J. Kaufmann, who wanted a home near the waterfalls of Bear Run. Wright took that notion to its extreme. "I want you to live with the waterfall," he is said to have told Kaufmann, "not just to look at it." Cantilevered concrete terraces hover some 30 feet above the falls. The incessant sound of rushing water permeates the home, yet never overwhelms. A boulder juts through the living room and doubles as a hearth. Low ceilings direct attention outside. During a visit to the house a couple of years ago, I was struck by Wright's vanishing windows, which open outward from wall corners, leaving no panes to obstruct the wilderness view.

Together these elements create a building that's timeless, organic and quintessentially American, says Franklin Toker, author of *Fallingwater Rising: Frank Lloyd Wright, E.J. Kaufmann, and America's Most Extraordinary House*. "You've never seen a building that fits with nature so tightly," Toker says. "It's not merely nature, it's animated. You've seen Vegas and Times Square, but you've never seen a building that's in constant motion."

—ERIC JAFFE

BILL BACHMANN / DANITADELIMONT.COM / DRR.NET; PAUL SEHEULT / EYE UBIQUITOUS / CORBIS

# SCALE NEW HEIGHTS

## Don't just see nature's most spectacular sites—experience them

## Yangtze River

Nearly 4,000 miles long, the Yangtze has watered civilizations for millennia—and laid waste to them too. The eighth-century poet Li Bai wrote that navigating the river was "even harder than climbing the sky." The 20th-century novelist Pearl S. Buck dubbed it "the wildest, wickedest river" for its murderous floods. So much of China's past lies on the Yangtze; now, a trip along the river also affords a glimpse of its future.

Start on the coast: Shanghai has been a market town for a thousand years. Once a stepchild of China's fledgling Communist government (the city's free-wheeling capitalism made it ideologically suspect), today it is the country's largest port. Upriver lies Nanjing, the on-again, off-again national capital across 17 turbulent centuries and home to the tomb of Sun Yat-sen (1866-1925), the founder of modern China. Next comes Wuhan, which boasts the third-century Xiang Pagoda. And then there's the Three Gorges Dam, China's 21st-century moment.

The dam is an engineering colossus—more than 600 feet high and nearly a mile and a half long—intended to control floods and produce electrical power. Yet the project presents a host of environmental concerns and has begun to inundate the majestic Three Gorges. Locks on the dam allow ships to keep traveling up to Chongking, where rescued artifacts are displayed in a museum. "If you like traveling on rivers, which is a great way to travel, there's still a great deal to see and learn about the scale of change and construction the Chinese are going through," says photographer Linda Butler, who visited the river eight times between 2000 and 2003 (see above) for her book *Yangtze Remembered*. — T.A. FRAIL

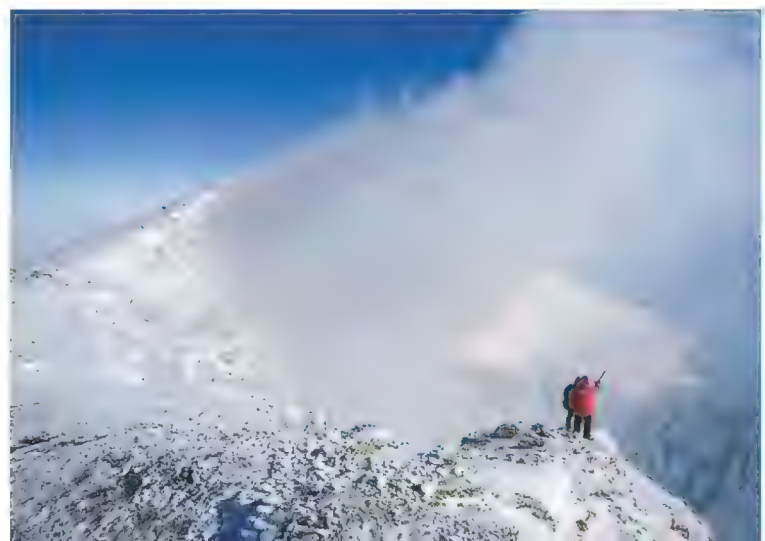
## Antarctica

Magical, surreal and otherworldly, Antarctica is a land of ultimates. As the southernmost continent, it is the coldest and windiest place on earth. And with virtually no rain and more than 95 percent of the landmass covered in ice, Antarctica is the world's largest desert.

Not surprisingly, it also has no permanent human residents, thus making it the only continent with no government or political activity. (That alone, by some people's standards, qualifies it as paradise.) The global community officially recognized the uniqueness of Antarctica with a 1959 treaty that set it apart as a scientific preserve.

Just as a blank canvas is an invitation for artists, Antarctica's vast unexplored territory has long beckoned all types of adventurers. Among the most recent is photographer George Steinmetz, who traveled there in 2005 (see below). "It's a humbling experience," he says. "It's a place where human beings clearly don't belong. You feel as if you are on another planet."

For most travelers, the simplest way to see Antarctica is from the deck of a cruise ship, where you can snap photos of glaciers, Adélie penguins and leopard seal colonies to your heart's content. But if you really want to leave your footprint on this frozen landscape, expedition agencies can take you into the continent's interior for mountain climbing and photo safaris. Dress warmly. — MOLLY ROBERTS



# Mount Kilimanjaro

Every year some 15,000 hikers suit up and climb Mount Kilimanjaro, the world's tallest freestanding mountain. They hire porters and pay anywhere from $900 for a basic package to $5,000 for luxury accommodations. Hikers are forbidden to climb the 19,340-foot mountain, which is in Tanzania, East Africa, without a guide.

The mountain is deceptive. "When you look at Kilimanjaro from a distance, it just looks manageable," says hiker Dick Munson, whose 2000 attempt to conquer it was halted 1,000 feet from the top when his 12-year-old son, Daniel, developed severe headaches. Only one in ten people complete the five- to six-day trek to the peak. The trick is to walk as slowly as one mile an hour, giving the body time to acclimate to the thin mountain air. The six ascent trails take hikers through five different ecosystems, from rain forest to arctic tundra, and temperatures from 90 degrees to 10 degrees Fahrenheit. After a while, says Munson, "you start thinking, is this really worth it?"

Nicolai Calabria says it is. The 13-year-old raised $57,000 for the Free Wheelchair Mission when he reached the summit last September. Nicolai was born without a right leg, a disability that he says has never hindered him. "I call it my challenge," he says. "I challenged the challenge."

—BETH PY-LIEBERMAN

# Grand Canyon

One night last year some friends and I pulled into Mather Campground on the Grand Canyon's South Rim. The 6,000-foot-deep, 277-mile-long and 18-mile-wide chasm nearby looked like an ocean masked by the dark. Come morning, watching the sun rise over the whittled canyon was as mesmerizing as watching waves roll in. But just as you can't grasp the size of the swells without swimming, you can't comprehend the depth of the rust-colored canyon until you venture down into it—and hike rim to rim.

The National Park Service recommends starting at the steeper North Rim, with a seven-mile hike along the North Kaibab Trail to Cottonwood Campground. From there, Day 2 entails a seven-mile hike in the gentler basin to historic Phantom Ranch, the only lodge below the rim. Day 3 bodes a ten-mile push up the Bright Angel Trail to the South Rim.

The three-day odyssey allows time to appreciate the two-billion-year-old cross section of the earth. "Rushing through the canyon is like rollerblading through the Louvre," says David Meyer, general manager of the Phantom Ranch. "You really have to take your time." As you hike, the gradually changing plant life—from the fir- and spruce-covered North Rim to the cactus- and mesquite-lined Colorado River—is the botanical equivalent of trekking from Canada to Mexico. As Mike Buchheit, director of the Grand Canyon Field Institute, says, "I've seen the canyon under a meteor shower, under an eclipse, all its moods and melodies—any one of which would be a memory of a lifetime."

—MEGAN GAMBINO

RICK D'ELIA / CORBIS; WHIT RICHARDSON / AURORA; P. 88 LINDA BUTLER / FROM *YANGTZE REMEMBERED* / STANFORD UNIVERSITY PRESS 2004; GEORGE STEINMETZ

# IN THE PRESENCE OF GODS

## Encounter temples so magnificent they could only have been built by divine inspiration

## Pagan

On the banks of the Irrawaddy River, more than 3,000 temples stretch across a 30-square-mile plain in Pagan, Myanmar (formerly Burma). Most were constructed between 1057 and 1287 during a building frenzy initiated by King Anawrahta, who formed the first Burmese kingdom in 1044.

Nearly a thousand years after Anawrahta's reign, visitors can climb to the top terrace of his Shwesandaw Paya, or "Sunset Pagoda," to enjoy panoramic views of the sprawling city. Many flock to monasteries, which display ornate murals, such as the Ananda Temple's 554 scenes from past lives of the Buddha.

Over the centuries, Pagan's architectural wonders have survived pillaging by armies, as well as natural disasters, including a devastating earthquake in 1975. But many experts worry that they may not withstand the inauthentic restorations recently sanctioned by the country's military junta. "The real crime is that the temples are being rebuilt without attention to their original appearance," says University of Texas art historian Donald Stadtner.

Still worse crimes are being committed against Burmese citizens. After bloody attacks by the junta on monks and other pro-democracy protesters in 2007, some dissidents are asking prospective tourists to carefully consider whether the regime deserves their monetary support. Those who do decide to visit should check State Department advisories before venturing into the region (called Bagan by the current government).

If history is any guide, Pagan will endure. Its majestic skyline, studded with gold, white and earth-red temples topped by bell-shaped towers and gilded spires, remains one of Southeast Asia's most exquisite sites.

—LUCINDA MOORE

## Parthenon

More than 2,400 years after its construction, the Parthenon—the sanctuary to the goddess Athena—still dominates the skyline of the Acropolis in Athens. The structure, originally painted in brilliant shades of red, green and blue, remained largely intact until 1687, when a force of Venetians laying siege to invading Turkish troops ignited a gunpowder magazine stored there. The explosion reduced the sanctuary to near ruins.

Today, the Greek government is overseeing a massive restoration effort. Although the edifice cannot be returned to its pre-1687 condition, the goal is to minimize, as much as possible, damage to what is left. (Replacement marble, for example, is being mined from the classical-era quarry that supplied the original.)

This past October, the final phase began with the creation at the base of the citadel of the Acropolis Museum, which will showcase more than 4,000 ancient statues, friezes and artifacts when it opens in autumn 2008.

One treasure, however, will remain absent—the marble friezes that England's Lord Elgin removed from the site between 1801 and 1803 and sold to the British Museum, where they remain. The designer of the new museum, Bernard Tschumi, has crowned his building with a glass gallery that awaits their return. "My hope," he recently told the *Christian Science Monitor*, "is that one day the [Elgin] marbles will be reunited and people can know the story all at once, in one single place."

—KATHLEEN BURKE

KEREN SU / CORBIS; ANN JOHANSSON / CORBIS

# Angkor Wat

Photographer Michael Freeman has seen it all. He's been to the Valley of the Kings in Egypt and remote temples in Sudan's Nubian desert. Yet nothing has moved him in the same way as Angkor Wat (see above) in Cambodia, where "scale, artistry and location are all superlative."

Angkor Wat is actually just one of more than a dozen magnificent temples in the vast metropolis of Angkor, the capital of the Khmer Empire from the 9th to the 15th centuries. Within Angkor Wat, carved bas-reliefs illustrate scenes from the *Ramayana* and the *Mahabharata*—epic poems that are also sacred Hindu texts. "Just think that the single temple of Angkor Wat has the same tonnage of rock as the Pyramid of Cheops," marvels Freeman, "yet much of it is carved." Small wonder then that at least two million tourists visited Angkor in 2007—and that number is expected to increase by more than 15 percent a year. The best way to avoid the crowds is to go off-season (May-October), when you can stand quietly among ruins embedded in the surrounding rain forest. —BRUCE HATHAWAY

# Ephesus

Over the centuries, a succession of empires—Greek, Persian, Roman, Byzantine and, finally, Ottoman—ruled over the city of Ephesus. Yet no matter how many times it changed hands, the city remained one of the most vibrant metropolises of the ancient world. Located on Turkey's western coast, nearly 300,000 people lived there at its height, in the second century A.D. Its busy seaport ferried goods from Asia to Greece, Italy and beyond.

Ephesus' greatest claim to fame was its temple to the goddess Artemis. One of the "seven wonders" of the ancient world, it was almost four times larger than the Parthenon in Athens. According to the New Testament, the Apostle Paul preached in Ephesus, prompting a riot led by silversmiths who crafted shrines to the goddess and feared for both their livelihoods and the future of the temple.

Today, a few columns are all that remain of the temple. But there is still much to see that evokes the city's former splendor. A three-tiered theater, built into the slope of a hill, once seated 25,000. Just outside the city stands the Church of Saint John, built in the fourth century over the evangelist's presumed tomb and expanded into a basilica some 200 years later.

Jodi Magness, an archaeologist at the University of North Carolina at Chapel Hill who has visited Ephesus more than a dozen times, says the city "is almost like a snapshot in time. You get the sense of what walking down the street of a Roman city was like without having to use your own imagination." —HELEN STARKWEATHER

MEDIOIMAGES / CORBIS; MICHAEL FREEMAN

# HERE TODAY, GONE TOMORROW?

## Visit these deteriorating or threatened destinations before they disappear

## Venice

A jewel of a city audaciously built on 118 tiny islands and a network of waterways, Venice is an imperiled treasure that stubbornly endures. Due to the plodding geological shifts of the continents, the city is sinking at a rate of two and a half inches per decade. A watery demise for Venice by the end of the century may be inevitable.

Many people are determined to save it. From a multibillion-dollar plan to install mobile floodgates to strengthening erosion barriers, the rescue mission has become an international effort.

But it's hard to imagine impending doom when you first encounter this enchanting Italian city. With its maze of narrow streets, hundreds of bridges and dozens of canals linking its magnificent architecture and art, even a wrong turn can be thrilling.

The deluxe way to see Venice is to cruise the canals in a pricey cushioned gondola poled by a boatman. "It is a wondrous experience, even though some people sniff at it as a tourist cliché," says Eric Denker, a senior lecturer at the National Gallery of Art who has visited Venice at least 50 times. "Gazing from water level, the city reveals vistas, waterfront facades, fenestration and bridge decorations you can find from no other angle." And, he says, the sleek gondolas can detour off the Grand Canal into smaller, less-traveled waterways.

Still, the Grand Canal, the city's main thoroughfare, is not to be missed. In 1495, the ambassador to French king Charles VIII called it "the most beautiful street in the world." And, fortunately, not much has changed since then. —MARIAN SMITH HOLMES

## Amazon Rain Forest

The Amazon rain forest covers more than two million square miles of the earth's surface, spanning eight South American countries. Although the region has no seasons, the Amazon River rises and falls by as much as 30 feet during the year, and the variety of living things one can see changes with it. Every journey reveals new wonders.

More than a third of the world's species—mostly plants and insects—make their home in the rain forest. But with the help of an experienced guide, you can also glimpse a rainbow of exotic creatures that includes toucans, red deer and pink dolphins. The astonishment and beauty of the Amazon lie "in the intricacy of this fabulously complex ecosystem," says Roger Harris, co-author of *The Amazon: The Bradt Travel Guide*.

Most travelers visit the western areas of the rain forest that remain largely untouched, such as the Loreto region of Peru, so they may not notice that the ecosystem is under siege. Already 20 percent of the forest has been cut down for timber or burned to make way for farms, with thousands more acres disappearing each day. "I've seen areas along the river where it's been beautiful, pristine forest one year, and the next it's been clearcut," says Harris. "That's pretty hard to take." —SARAH ZIELINSKI

CORBIS; MICHAEL & PATRICIA FOGDEN / MINDEN PICTURES; P. 93 D. PARER & E. PARER-COOK / AUSCAPE / MINDEN PICTURES; ROBERT Y. ONO / CORBIS

Which of the 28 places made your list? Go to Smithsonian.com/lifelist and tell us

# Great Barrier Reef

To say that the Great Barrier Reef is the world's largest coral reef may be understating things; the Australian government notes that it is "the only living organic collective visible from Earth's orbit." Certainly, it is vast—a conglomeration of some 3,000 reefs and 600 islands stretching more than 1,250 miles along Australia's northeast coast. Green turtles, dolphins and whales live there, along with 200 species of birds, 1,500 species of fish, 4,000 species of mollusks and, yes, an abundance of corals.

But big does not mean indestructible. The Great Barrier Reef Marine Park Authority, which has jurisdiction over much of the reef, has taken steps to control water pollution, conserve coastal wetlands and set rules for who can do what and where. Global warming is a more difficult challenge: rising sea temperatures are causing mass coral bleaching—episodes in which corals lose their color after expelling the one-celled algae that live within their tissues. This is a sign of stress, and it can kill afflicted corals. A recent report by the Intergovernmental Panel on Climate Change projects annual bleachings by as early as 2030. One possible result: a "functionally extinct" ecosystem by 2050.

The reef attracts about two million visitors a year, but that's OK, says Terry Hughes, director of the Australian Research Council's Centre of Excellence for Coral Reef Studies. "The tourism industry is an active advocate for the reef," he explains. "Tourists are taught to look but not touch, and to be careful when reef walking or snorkeling." —T.A. FRAIL

# Galápagos Islands

Giant tortoises lumber across the lava rocks, while iguanas defy desert stereotypes and plunge into the sea. The strange, conspicuously adapted wildlife that impressed Charles Darwin when he visited the Galápagos Islands in 1835—and that would later kindle his discovery of the process of evolution by natural selection—is still there. In fact, the Galápagos, 14 major and many smaller islands spanning the Equator 620 miles off the coast of Ecuador, remains the world's most biologically intact tropical archipelago.

But pollution, overfishing and development are harming efforts to conserve habitat and wildlife. A tourism boom is also taking its toll. The number of visitors has more than tripled in the past 15 years, to at least 145,000 in 2006. The islands are mostly under the control of Galapágos National Park, which restricts access to designated areas. Still, people over the years have unwittingly or deliberately introduced invasive life-forms that can undermine the natural order—some 750 alien plant species and 490 insect species, according to a 2007 report by the Charles Darwin Foundation. Scientists warn that the damage could be irreversible.

And yet the islands beckon. Evolution disciples should tread lightly, says Heather Hansen, co-author with Kimberly Lisagor of the soon-to-be published book *Disappearing Destinations*. To minimize the "Caribbeanesque chaos" of "uninvested tourists just stopping by for a day or two during a megacruise," Hansen recommends that travelers enlist only "outfitters that have a proven record of both environmental protection and a focus on enhancing the lives of the people who live there." —TERENCE MONMANEY

# Sound and Fury

## Norman Mailer's anger and towering ego propelled —and undermined— his prodigious output

**BY LANCE MORROW**

According to the author, Mailer (in 1987) embodied many of America's worst faults: self-indulgence, bullying, entitlement.

ANNIE LEIBOWITZ / CONTACT PRESS IMAGES

**ABE ROSENTHAL** of the *New York Times* and Norman Mailer stood talking at Carl Bernstein's 50th birthday party. It was Valentine's Day, 1994. The room in Bernstein's apartment in the meatpacking district of Manhattan was illuminated with votive candles. They caused Mailer's backlit nimbus of wiry white hair to glow with an ecclesiastical radiance. He rocked back and forth on the balls of his feet in the boxer's way he had, a rhythmic motion meant to conjure menace, as if he wished to let you know that while he had one foot safely on the brake, the other was pressed on the accelerator, his motor surging . . . so that if he chose, he might release the brake and hurtle across the room and smash through the brick wall and cause God knows what mayhem in the world outside.

On the other hand, Mailer had aged (he was past 70), and when he paused to reflect on a point in the conversation, his belligerent, impatient rocking might grow benign, as if transformed into a kind of davening. "Menace" and "dread" and "doom" and "terror" and similar items out of the hipster and existentialist vocabulary of "The White Negro" from decades earlier remained stage effects he brought out from time to time. But mostly those had given way, in private, to the Prospero's twinkle. Surely his quest for the "apocalyptic orgasm" had been abandoned.

Rosenthal and Mailer were gladiators of old, independently famous for ferocity in the arena, Rosenthal as the off-with-their-heads autocrat editor of the *Times*, Mailer as the media's idea of the American writer as Tasmanian devil. They were brawlers emeritus now, two old pros; Mailer affected a banker's three-piece suit. Their talk was mellow and thoughtful (still more speculation about the Kennedy assassination—Mailer was just back from Moscow, where he had been researching a book on Lee Harvey Oswald).

Lesley Stahl of CBS News wandered over and listened for a moment, and asked Mailer if he had read a certain book that dealt with the subject.

Mailer's eyes kindled, and cut sidelong at Stahl. His mouth cut sidelong as well. He growled—it was actually a quick bark, one dog warning another to stay away from his dinner bowl—and said, "Stupidest f—ing book I ever read."

Stahl paled and said, softly, "My husband wrote it." (That was the journalist Aaron Latham.)

Half-second's pause. Mailer stared straight ahead, weighing whether to repent and apologize—his manners had improved; the everyday Mailer now was usually courteous and kind, in private anyway, which gave him one-sixth of the virtues in the Boy Scout Law. So his inner Boy Scout had a tussle with his nasty controversialist instincts. He considered, and then he fired off his decision, out of the corner of his mouth: "It's still the stupidest f---ing book I ever read."

He resumed rocking back and forth, his banker's vest all but bouncing off Abe Rosenthal.

Stahl (who declined to comment for this article) drifted away, a little stunned.

I TELL THE STORY, though I realize, sheepishly, that in recounting it, I am guilty here and there of the sincerest form of flattery, unconsciously adopting a bit of the manner and style of Mailer's own storytelling. That may happen when you write about a powerful writer; after reading and rereading his prose for a while, his resonances and rhythms get into your mind; the same effect may occur if writing about Hemingway or Nabokov. Whatever else Mailer may have been, his was a distinctive voice, and his excesses and peculiarities belonged to his time.

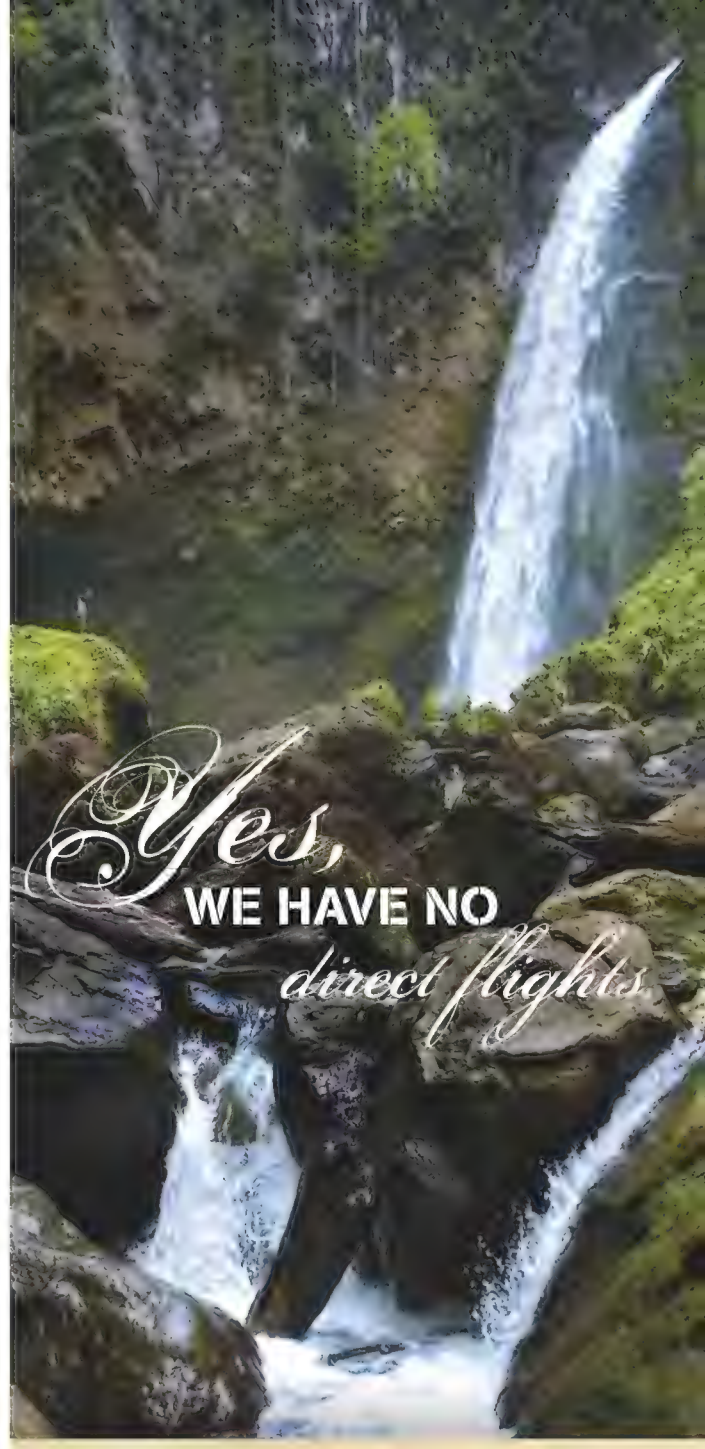
I mention Bernstein's birthday party also because it drew together at least three elements of Norman Mailer's later universe, the period of his assumption into that media heaven where the snarling and tedious old bruiser becomes a "cultural icon" and his once irreconcilable hatreds and rages and controversies dissolve in the urbane opulence of Celebrity. The three interlocking elements gathered in Bernstein's apartment were, one, Big Journalism (the host himself and his old partner, Bob Woodward, Nixon-slayers long ago; Lesley Stahl, Abe Rosenthal, many others); two, Big History (Oswald, the Kennedy assassination, Watergate), and three, Big Chatter, the flashing Manhattan snickersnack (author Mailer briskly flicking his blade at the "stupidest f---ing book I ever read").

That line was a risky one for Mailer, of all people, to allow himself: whatever my admiration for the energies of his style in such books of reportage as *The Armies of the Night* and *Miami and the Siege of Chicago*, works that showcased his gifts as what might be called a magnificently observant Big Foot narcissist, I can think of a half-dozen of Mailer's other books on which, over the years, I have pronounced the same verdict that Mailer delivered at the birthday party ("the stupidest . . . ").

In 1979, I was professionally compelled to read every word of the 1,056 pages of *The Executioner's Song*, about the life and, in 1977, death of Utah murderer Gary Gilmore. The volume was heavy, and I nearly dislocated my shoulder when I threw it across the room. It made a dent in the plaster. Still, it was an interesting piece of work, though somewhat contaminated by the fact that Mailer had assembled it from many hours of tape-recorded interviews with Gilmore by another man, Lawrence Schiller. Mailer couched the book in an aimlessly meandering American white trash plainstyle that was a departure from the extravagant metaphors and densely energetic (if sometimes sophomoric) metaphysics of other works. The plainstyle was praised as genius, but I suspect Mailer was simply being faithful to the flatness of the Schiller transcripts.

Now Mailer is dead. I have his literary legacy piled on the desk, a formidable massif—46 books, an impressive body of work. Mailer, for all of the drinking and fistfighting and marital disorder of his early and middle years (married six times, father of nine children), was a prolific, indefatigable writer (in part, of course, to pay alimony and

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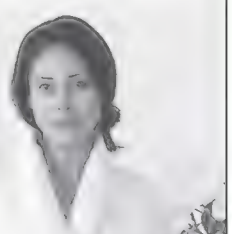

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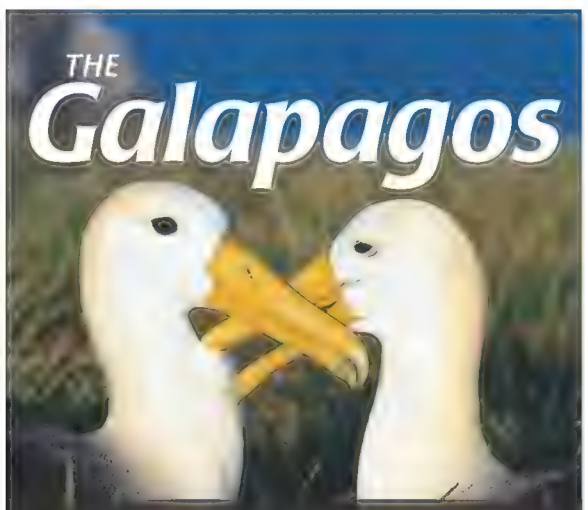

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**Mailer (with Carl Bernstein at a 1990 fete), the author says, is already dated.**

child support). He kept at it to the last. Only ten months before his death he published the novel *The Castle in the Forest*, a creditable study of Hitler's childhood and the formation of evil.

Still, Mailer and a lot of his work are dated now—as dated as Doris Day (who came from the same time but a different planet). If Mailer is dated, what was his "period"? He had a number of them. Mailer had a gift for psychic mimicry, and he tried out different voices, different personas, at different times. In his ghastly book on Marilyn Monroe, whom he described in the very first paragraph as "our angel, the sweet angel of sex" (it gets much, much worse from there on), he quoted Virginia Woolf: "A biography is considered complete if it merely accounts for six or seven selves, whereas a person may well have as many as one thousand."

Mailer's obituaries tended to settle for the nil nisi hokum note. With indignant exceptions, they were excessively and even unthinkingly generous. Mailer was "a giant of American letters." Compared to whom? *The Executioner's Song* was a "masterpiece." The obit writers were taken with the paradox of diminutive Mailer being a "giant"—thinking subliminally, I suppose, of strutty, puffing Stephen A. Douglas, the "Little Giant"—and they unfailingly took note of the author's "giant ego." They used the phrase affectionately. The huge ego was presented as a virtue (in somewhat the way that the comedi-

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an Don Rickles, whose shtick is insult, is thought to be endearing).

I am not sure about the ego. On the evidence of his writing and of the gaudy hype that he managed to churn up around himself and his books, his ego was an unpleasant and a poisonous thing. Perhaps the ego—another of his paradoxes—was a facet of his mimicry: by impersonating his characters, his imperial ego would simultaneously ingest them.

His ego was first of all a reflection of his character as an American. Mailer unceasingly criticized America (the "cancer" of metaphysical Eisenhowerism, and Vietnam and so on), and yet in his own ways he embodied America's worst faults: self-indulgence, bullying, sense of entitlement, irrelevant belligerence, the obnoxious American self-importance that is a corrupted Emersonianism—Emerson without the sweetness, the calm, the brains, the transcendence. Mailer was a true American cosmic rube, as was that other fanatic, Captain Ahab. Mailer was a perfectly American loudmouth, braggart and blowhard. To all of this, he added a distinctly American profligacy (serial marriages, drug-taking, violence). Like America, Mailer in his own small, furious way emitted the sort of imperial-individualist energy that, among other things, disables humility (that great neglected virtue) and self-understanding and excites a certain wonder and loathing in the world.

In his recently published *Journals*, the late Arthur Schlesinger Jr. remarked in an entry dated May 15, 1985: "It is interesting to see how much Norman fits into the American literary tradition—and how little aware he is of that tradition. He is what Tocqueville prophesied—'strong and rapid emotions, startling passages, truths and errors brilliant enough to rouse [the readers] up and then plunge them at once, as if by violence, into the midst of the subject. . . . Style will frequently be fantastic, incorrect, overburdened, and loose, almost always vehement and bold . . . immense and incoherent imagery, with exaggerated descriptions and strange creations. . . . Man himself

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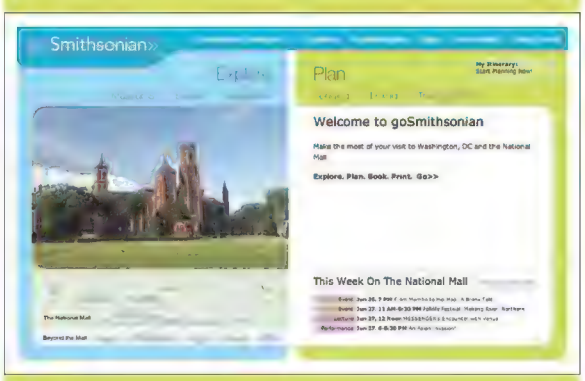


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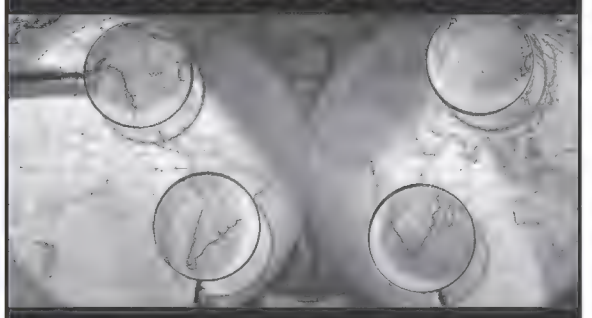

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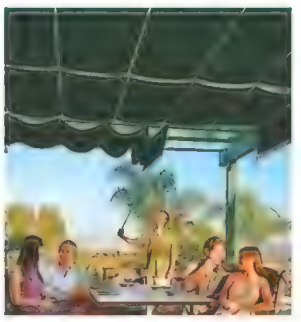

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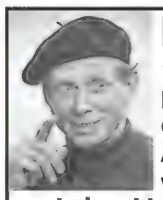

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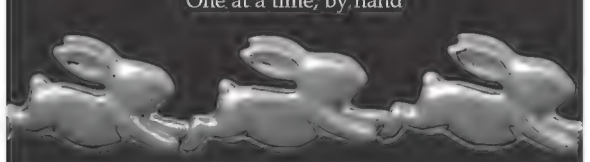

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taken aloof from his country and his age and standing in the presence of Nature and of God.'" As with much else, Tocqueville had Mailer down *avant la lettre*.

In Mailer's work, one feels more in the presence of energy and virtuosity than of truth—another difference between Mailer and Emerson, or for that matter, between Mailer and Whitman. Except for some journalistic bull's-eyes in the reportage (riffs on politicians like Nixon and Hubert Humphrey and Eugene McCarthy), Mailer simply does not feel true. Reading some of his more strenuous cosmic exertions is a little like watching an actor onstage who picks up a suitcase that is supposedly full, but is, in fact, empty: the actor by body English tries to make the bag look heavy, as Mailer tries to make the sentences profound. But the audience knows.

That's a reason I do not think his work will last—do not believe that he will be much reread, as, say, Dickens or Tolstoy or Forster are reread. Too much untranscended ego. His enormous novels on the CIA (*Harlot's Ghost*) or on Gary Gilmore are impressive exercises in research and mimicry (which amounts to the egotist's presumption that he can appropriate another person's life and thoughts), but somehow the "giant ego" is a prison. His unreadable *Ancient Evenings*, starring pharaohs and mummies, is, in Thomas Hardy's phrase, "the deadest thing alive enough to have strength to die." Not for nothing (to use a Mailerism) did the author adopt Jack Henry Abbott, the literary convict who published a furious book titled *In the Belly of the Beast*. Mailer helped to get his mascot Abbott released from prison, and very soon thereafter Abbott murdered a restaurant waiter on New York's Lower East Side.

Something in Mailer identified with Abbott, with violence and murder, which he closely, gruesomely, associated with various acts of sex. As with Ezra Pound, one has the problem of critically and morally disentangling the author's behavior from his work. In November of 1960, Mailer repeatedly stabbed his second wife, Adele Morales, with a

penknife. It happened at the end of an all-night drinking party. She was badly wounded in the abdomen and back but refused to press charges. (The stabbing was not as bad in its consequences as what William Burroughs did to his wife one night in 1951: Burroughs shot her dead in Mexico City in a drunken game of William Tell and the apple. One difference was that Mailer went at his wife as if he actually meant to kill her; Burroughs made an evil mistake while trying precisely not to shoot her.)

But all experience is material for the thrifty writer, and having stabbed his wife, Mailer went on to write the novel *An American Dream,* in which the hero, Rojack, in quick succession strangles his wife; walks downstairs to the bedroom of Ruta, the German maid, and buggers her interminably (she is, of course, grateful); and then throws his wife's corpse out the apartment window and into traffic on East River Drive some stories below. After murdering his wife, Rojack reports, "I was weary with a most honorable fatigue, and my flesh seemed new. I had not felt so nice since I was twelve." (Take a bow, Marquis de Sade.) In his notorious essay "The White Negro," from 1957, Mailer argued that "courage of a sort" was necessary when "two strong eighteen-year-old hoodlums . . . beat in the brains of a candy-store keeper . . . for one murders not only a weak fifty-year-old man but an institution as well, one violates private property. . . . The hoodlum is therefore daring the unknown."

Mailer had a disagreeable fascination with foul smells—a metaphysical attraction to the mephitic. His books reek with loathsome stenches. His primary sense-resource as a writer was sight—his visual images are vivid and strong. But a strong (horribly strong) second was the sense-resource of smell. Mailer had a hound's nose that picked up every rotten trace and extracted from each stench some new sophomoric wallow of debasement. Here's the narrator of *Harlot's Ghost*: "I was chilled in my mind, chilled in my heart, and not without the beginnings of some lively [homosexual] disturbance below [that is, in the groin]. The


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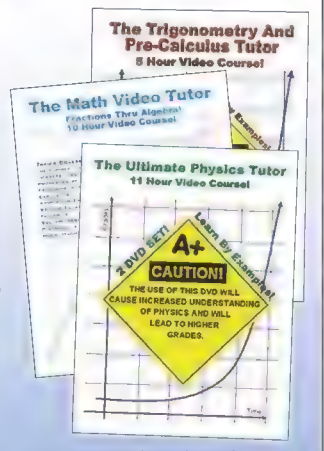
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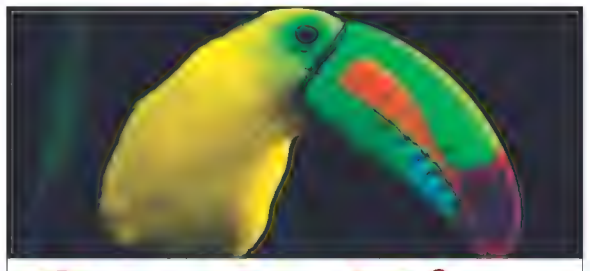

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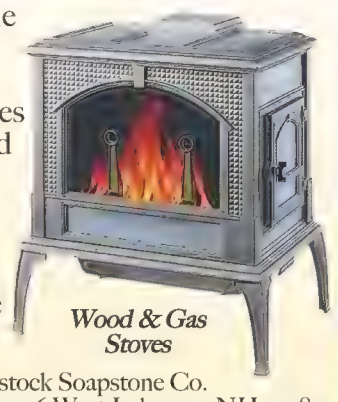

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**Many critics found it hard to separate Mailer's behavior from his work.**

nearness of sex to urine and feces seemed a monstrosity, as if some mongoloid of the Devil had been there at the Creation dictating nether anatomy. The smell of drains, prevalent in these nocturnal Berlin streets, was in my nose." Love has pitched his mansion in the place of excrement. Oh dear, oh dear.

The French novelist Paul Bourget sent one of his books to Henry James; James read it and wrote to Bourget: "In a word, all this is far from being life as I feel it, as I see it, as I know it, as I wish to know it." Prissy, of course. But what was prissy to the hip may become as it were a new context. In the world that is coming—we see it already, bringing with it soberingly inescapable global absolutes—an entirely different set of virtues and interests will come into play, and in that new perspective, the works of Norman Mailer will seem, I would guess, an almost total irrelevance.

Mailer spent too much time in incoherent but grandiloquent flirtations with absolutes that he was unequipped to handle. For 60 years he banged about the stage as Glendower: "I can call spirits from the vasty deep!"

But they never came when he called them. Not once.


**LANCE MORROW**'s *most recent book is* Second Drafts of History. *He is now working on a biography of Henry Luce.*


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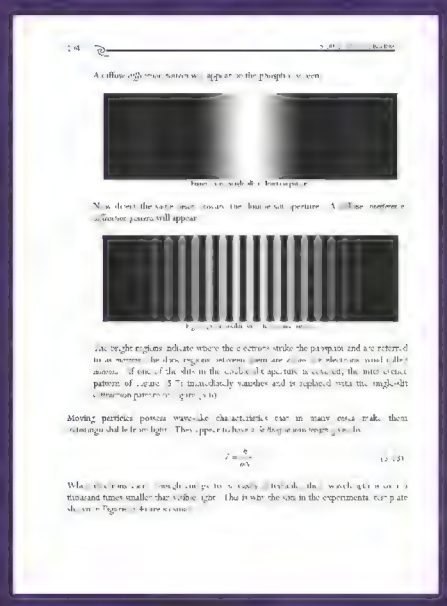

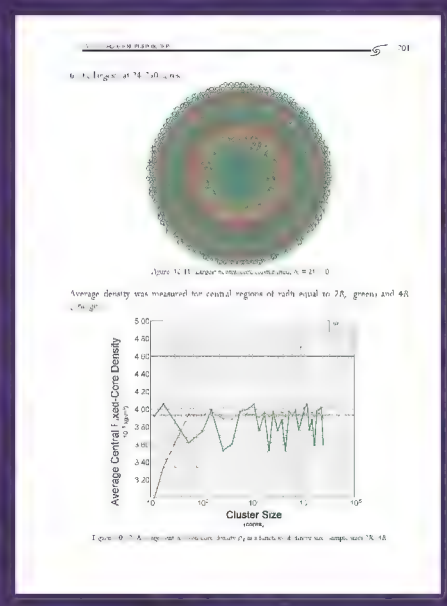


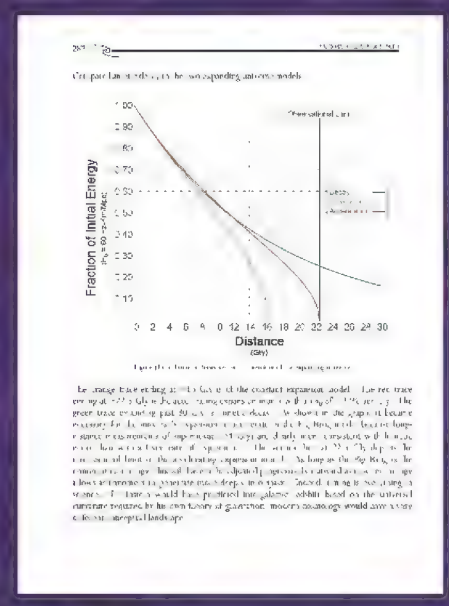

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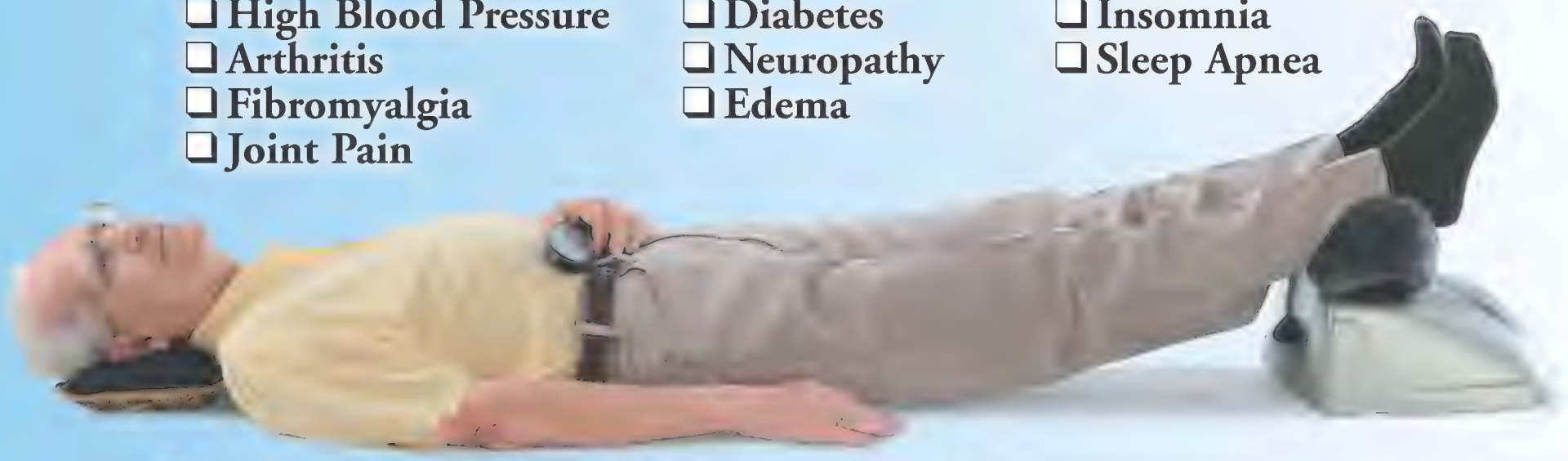

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# What people are saying about the Exerciser 2000 Elite™

After using the Exerciser 2000 Elite™ twice a day for one week the swelling in my ankles went away. It has also helped my breathing, as I can get out and walk without having to stop and catch my breath! Thank you. *—Shirley H., Florida*

After having a stroke, I could no longer exercise the way I used to. As a result, I developed edema. A friend of mine introduced me to the Exerciser 2000 Elite™. I loved it and I purchased one for myself. After using the machine daily for a few weeks, my symptoms of edema were completely gone. I now use the machine twice a day for 16 minutes each time on speed 3. What a wonderful way to exercise.*—Robert M.*

I am in my late 80's and have diabetes. The first thing I noticed when I started using my machine was that my feet were warm when I went to bed. They were always ice cold before. Because one of my problems is poor circulation, I use the machine three times a day for 10 minutes each; in the morning, late afternoon and just before bed. I almost forgot to mention that I have not been able to lift my arms above my head. Now I can do it. You think that's no big deal until you can't do it anymore. *—Ralph K.*

As a Chiropractor, I would like to say that the Exerciser 2000 Elite™ enables people to benefit themselves at home. It is a valuable asset in moving lymph fluid, oxygenating the blood, increasing immune system function, maintaining mobility in the spine, and additionally freeing up a spine that has become stiff and arthritic. *—Garry Gorsuch, D.C.*

I love using the Exerciser 2000 Elite™ after my morning workout. It is an excellent way to cool down and it helps to start my day off right.*—Deanna C., Kansas*

My husband and I have been into natural products all of our lives but nothing has ever affected us like the Exerciser 2000 Elite™. My husband is 72 and delivers flowers. He carries 5 gallon buckets of water. Since using the machine, his back hasn't hurt him at all. My hips would hurt if I stood too long and I would get weak and have to sit down. Now I can walk and sit as long as I want. I don't take pain medication anymore. In the morning, when I get out of bed I'm not stiff anymore. At 65, wow, this is great! Thank you for offering such a great machine. We are going to tell everyone we know about it. *—Cheryl J.*

The ad I saw almost sounded "too good to be true". With your no risk money back guarantee I figured I had nothing to lose so I purchased the machine… and boy, am I glad I did! I am 75 years old and suffer from sciatica, which makes my back and legs tighten up and causes numbness. I was taking 8-10 Aleve™ every day. After using the machine for only 4 minutes, I noticed my lower back loosening up. Since I have been using the machine I haven't taken any pain pills and have been pain free. My sciatica is not giving me problems anymore and my body stays loosened up. I have also had a snoring problem for quite some time, however, since using the machine my snoring has subsided. My wife is so excited! I cannot tell you how much this machine has turned my life around. *—C. Cummings*

I have had constipation problems for over 25 years. Since I have been using the Exerciser 2000 Elite™ I have been regular every day and have begun to lose weight. This is truly a blessing and is so easy to use. *—Jeannie*

I had suffered with sleep apnea for many years and had been taking drugs for it. I was told I would have to use a breathing apparatus. In the meantime, I was introduced to the Exerciser 2000 Elite™ and decided to purchase one. Within two weeks, I was sleeping more deeply and restfully than ever before. *—David B.*

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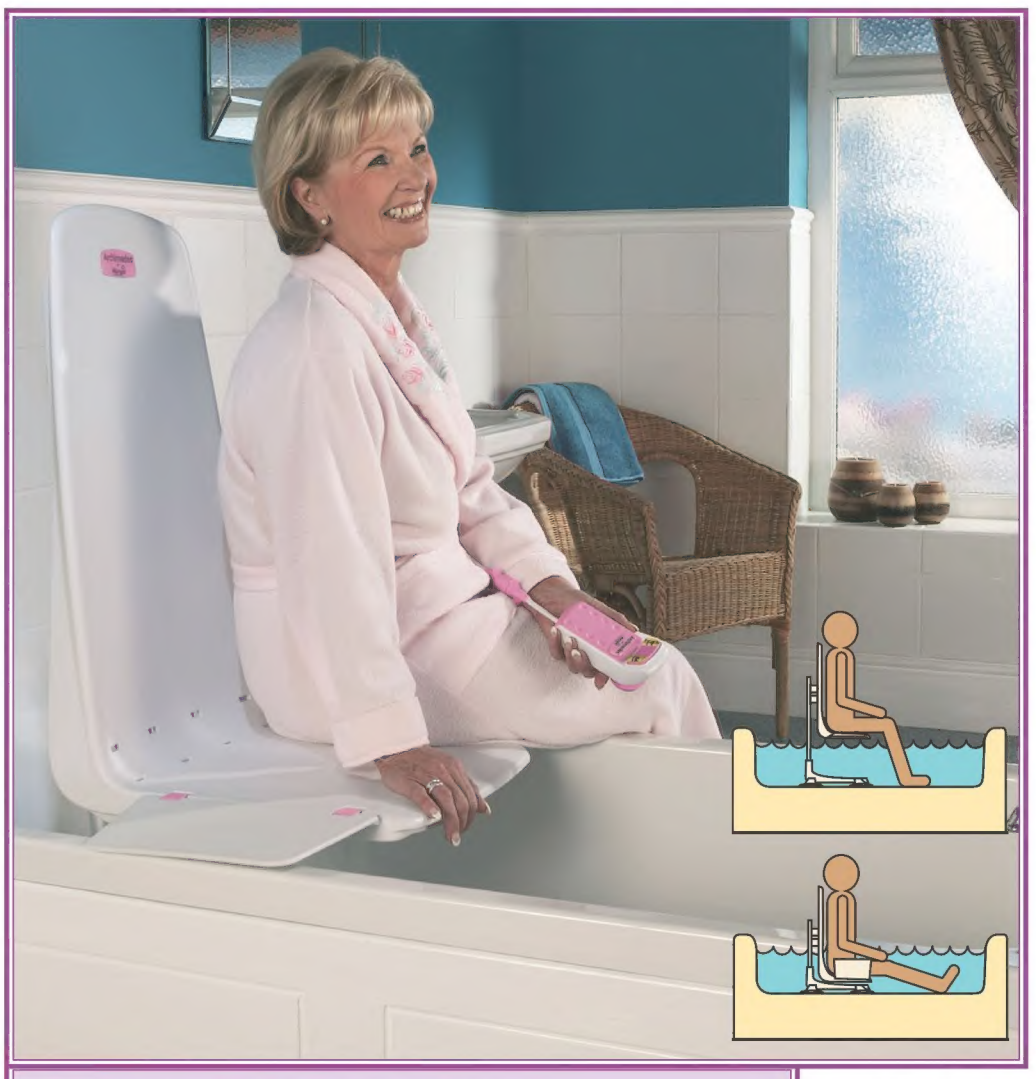
By John Fleming



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# Duck and Cover

An awkward case of the Cordon blues **BY KATHLEEN FLINN**

**SOME PEOPLE INSIST** that Julia Child dropped an entire chicken on the floor while filming her TV series, *The French Chef*. In truth, she dropped only some potatoes she was trying to flip in a pan. But I wish it were true; I wouldn't feel so bad about the duck.

It is my fifth week at France's elite culinary school, Le Cordon Bleu. Everything is going well with my latest assignment: *canette rôtie aux navets*, roast duckling with turnips. Aiming below the knee joint, I whack the webbed feet off in one swift blow. Chef Bouveret whistles as he walks around the room and collects the feet in a large stainless-steel bowl. I pick off the excess feathers, cut out the wishbone and truss what remains into a neat package. Then, I follow Le Cordon Bleu's precise roasting instructions. I'm dubious about the short cooking time until—after only 35 minutes—I see the brown and tender duckling, its skin just ever so taut. I rest the pan on the open oven door as I insert my roasting fork into it to turn it over for the last minutes of cooking.

Then, my wrist hits the edge of the pan.

My duck flies from the roasting fork into the air and drops onto the floor. It keeps rolling, like a succulent little football, to the edge of my classmate Anna-Clare's stove.

Now, there is one thing that's true about Julia Child: she said you should never confess to mistakes not witnessed by others.

"Remember, you're alone in the kitchen," she would say. "You must stand by your convictions and just pretend that was the way it was supposed to turn out."

But I am not alone. There are nine other students, plus the nosy Algerian dishwasher in the kitchen, restocking pans. Mercifully, Chef Bouveret is out of the room. Anna-Clare eyes the duck with a look of horror—for a good reason. The *sous-sol* (storage room manager) sent up only five ducks today. We're sharing this one.

I put a finger to my lips to Anna-Clare and the dishwasher. Without a word, I scoop up the hot duck with my side towel and toss it into the pan, shove it in the oven and slam the door. I stand up and bump into another student, L.P., standing in front of me. Her face says it all. She doesn't approve, and I sense a lecture coming. But then, Chef Bouveret returns to the room, whistling and triumphant, having found the turnips that had been missing from the class basket.

"Look, look," he says, holding up the bowl.

I proceed with my recipe and plate as usual.

By now, whispered word of the dropped duck has spread. The dishwasher peeks around the corner. Will I let the chef taste the contaminated duck?

Chef tries the sauce. Good consistency, he says, but it needs more salt. My vegetable cuts earn a "*bien*." He tastes a tender turnip. His hand, clutching a small plastic spoon, hovers above the duck-breast meat, sliced thin and fanned out on the plate. Instead of taking a bite, he directs my attention to the coloring of the meat.

"Look, look, *ici*. *Pas assez cuit*," Chef says. It needed two more minutes of cooking on one side, he says. But otherwise, it's "*bon travail*," nice work.

In the locker room, Anna-Clare and I debate the duck. Why couldn't you reclaim food as long as it fell on a clean floor? And what about the "five-second" rule—that food won't pick up any bacteria in such a short period of time?

Still, when I take my half home, I tell my boyfriend, Mike, "Just don't eat the skin." He asks why. "It's a long story," I say.

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